* NOTICES *

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SMINS

(57)[Claim(s)]

Claim 1]

A polyoxyalkylene series polymer (A) which has a silicon containing functional group which can construct a bridge by forming a siloxane bond,

Silicate (B).

As a silanol condensation catalyst, they are carboxylic acid tin salt (C) and a non-tin catalyst (E). an amine compound — and

Silicata (B) is tetra alkoxysilane or its partial hydrolysis condensate, t is a hardenability constituent to contain,

A carbon atom in which a non-tin catalyst (E) adjoins a carbonyl group is carboxylic acid which is the A carbon atom in which carboxylic acid tin salt (C) adjoins a carbonyl group is the carboxylic acid tin salt which is the 4th class carbon,

A polyoxyalkylene series polymer in which a polyoxyalkylene series polymer (A) which has a silioon containing functional group which can construct a bridge by forming a siloxane bond introduced an A hardenability constituent.

different. When the Tori ORGANO siloxy group shown by aryl group of the carbon numbers 6-20, an an alkyl group of the carbon numbers 1-20 from which R¹ in a formula and R² were the same as or aralkyl group of the carbon numbers 7-20, or ${
m (R)}_3{
m SiO-}$ is shown and ${
m R}^1$ or two or more ${
m R}^2$ exist, unsaturation group into an end, and a general formula (1): H-(SiR1 2-bX bO) m-SiR2 3-aX a (1)

hydrolytic basis, and when two or more X exists, they may be the same and may differ. As for a, 0, 1, 2, or 35 shows 0, 1, or 2, respectively. About b in m bases (SiR¹ ₂₋₆ X ₆O), they may be the same and numbers 1-20 here, and three R' may be the same and may differ. X shows a hydroxyl group or a they may be the same and may differ. R' is a hydrocarbon group of monovalanca of the carbon

may differ. m shows an integer of 0 to 19, however — what satisfies a+sigma b>=1 — carrying out the hardenability constituent according to claim 1 being a polyoxyalkylene series polymer obtained by an addition reaction with a hydrosilane compound expressed.

The hardenability constituent according to claim 1 or 2 in which a polyoxyalkylane series polymer (A) which has a silicon containing functional group which can construct a bridge by forming a alloxane bond is characterized by being a polymer which does not contain an amide segment (-NH-CO-) substantially in a principal chain skeleton. An object for interior panels containing a hardenability constituent of a description in any 1 paragraph of Claims 1-3, an object for face panels, or adhesives for car panels.

A sealing material for working joint of a building containing a hardenability constituent of a description in any 1 paragraph of Glaims 1—3.

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JP,4101632,B [CLAIMS]

[Translation done.]

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DETAILED DESCRIPTION

Detailed Description of the Invention

ilicon containing functional group (henceforth a reactive silicon group) which can construct a bridga his invention relates to the hardenability constituent containing the organic polymer which has a Field of the Invention

Description of the Prior Art by forming a siloxane bond.

t is known that the organic polymer which contains at least ona reactive silicon group in a molecule accompanied by the hydrolysis reaction of a reactive silicon group, etc., and a rubber-like hardened as the interesting charactar in which construct a bridge by formation of the siloxane bond naterial is obtained with hygrosoopic surface moisture etc. also in a room temperature. In the polymer which has these reactive silicon groups, a polyoxyalkylene series polymer and a polyisobutylene system polymer are already produced industrially, and are widely used for uses, such as a sealing material, adhesives, and a paint.

The adheaves for interior panels, the adheaves for face panels, the adheaves for tilling, the adheaves for their the rest for the rest for the adheaves for finding will the adheaves the formal adheaves for finding will the adheaves to car panels, etc. is finding to adhibity or ence positione, an adheaves for the adheaves for the panels.

nay pass with prudence and the stress from the outside of adherend, it may change by the time, and nferior to stability or creep resistance, an adhesives layer may pass and it may change by the time, and oreop resistance are bad, an adhosives layer may pass, and it may change by the time, and may be connected with the degradation of apparatus. Therefore, it is called for that the constituent for a panel tile, a stone, etc. may shift. Also in ceiling finishing adhesives or floor finishing adhesives, if electric equipment, an alactron, and the adhasives for precision-mechanical-equipment assemblies and unevenness of a ceiling surface or a floor line may arise. If the stability of the electrical and these adhesives is excellent in stability or creep resistance.

over a long period of time is very important, excelling in stability or endurance is called for as physical properties of a hardened material. Working joint of a building with an especially large change of joint for a sealing material, the sealing material for direct grazing, the sealing material for multiple glass, the width (Kasagi) the circumference of glass, the circumference of a window frame and a sash, a curtain wall, and various face panels — business — stability and endurance excellent in the constituent used used in order to give watertight and airtightness. Therefore, since the flattery nature to the use part A sealing material generally fills up the joined part and crevice between various members, and he is scaling material for speed signal generator construction methods, etc. are called for.

documents 7), the (patent documents 8). (The patent documents 9), the (patent documents 10), the documents 13), the (patent documents 13), the (patent documents 13), the (patent documents 13), the (patent documents 15), the (patent documents 15), the (patent documents 15), the (patent documents 17), the (patent documents 18), the (patent docum On the other hand, (the patent documents 1), the (patent documents 2), the (patent documents 3), the (patent documents 4), (The patent documents 5), the (patent documents 6), the (patent

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JP,4101632,B [DETAILED DESCRIPTION]

constituent which uses as an essential ingredient the organic polymer which has the reactive silicon mainly indicated, and the description which suggests stability, creep resistance, and endurance is not group which three hydrolytic bases combined on silicon is indicated. In these advanced technology, documents 22), the (patent documents 23), the (patent documents 24), the (patent documents 18), the (patent documents 19), the (patent documents 20), In (the patent he fast curability based on the reactive silicon group which three hydrolytic bases combined is the (patent documents 25), the (patent documents 28), the (patent documents 27), the (patent documents 28), and the (patent documents 29), Although the room-temperature-curing nature documents 21), the (patent ndicated.

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0034

Patent documents 28] JP,2001-72855,A

Patent documents 29]

A.17771,A

Problem(s) to be Solved by the Invention

An object in view of the above-mentioned actual condition of this invention is to provide the stability. beiling finishing adhesives, Floor finishing adhesives, the adhesives for finishing of wall, the adhesives endurance, and oreep resistance corrective strategy of a hardenod material. The adhesives for interior panels with which stability, endurance, and creep resistance have been improved as for this nvention, The adhesives for face panels, the adhesives for tiling, the adhesives for stone tensions, for oar panels, the electrical and electric equipment, an electron and the adhesives for precisionmechanical-equipment assemblies, It aims at providing the sealing material for direct grazing, the sealing material for multiple glass, the sealing material for speed signal generator construction mathoda, or the sealing material for working joint of a building. An object of this invention is to provide the hardenability constituent which can give the hardened material excellant in stability, andurance, and creep resistance. attp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl.i... 2010/04/30

JP.4101632,B [DETAILED DESCRIPTION]

Means for Solving the Problem]

3y using on silicon a silicon containing functional group which has threa or more hydrolytic bases as nvention persons may solve such a problam, it found out improving stability, endurance, and creep a reactive silicon group of this polymar, as a result of inquiring wholehaartedly, in order that this resistance, and this invention was completed.

hardened material using an organio polymer (A) which has a silicon cortaining functional group which can construct a bridge by forming a siloxane bond of this invention, and a hardenability constituent That is, the 1st is related with stability, endurance, and creep resistance corrective strategy of a containing silicate (B). he 2nd is an organic polymer which has a silicon containing functional group which can construct a containing an organic polymer (A1) which is a silicon containing functional group which has three or oridge by forming a siloxane bond of this invention, A silicon containing functional group which can resistance corrective strategy of a hardened material using on silicon a hardenability constituent construct a bridge by forming a siloxane bond, It is related with stability, endurance, and creep nore hydrolytic bases,

andurance, and creep resistance corrective strategy of a hardened material given in the above using construct a bridge by forming a siloxane bond as a desirable embodiment, it is related with stability, A main chain of an organic polymer (A1) which has a ailicon containing functional group which can a hardenability constituent which is an acrylic ester systam copolymer manufactured by a living-'adical-polymerization method (meta), t is related with stability, endurance, and creep resistance corrective strategy of a hardened material given in said either using a hardenability constituent which contains silicate (B) further as a desirable embodiment. 0042

t is related with stability, endurance, and creep resistance corrective strategy of a hardened material given in said either using a hardenability constituent which contains carboxylic soid tin salt (C) urther as a desirable embodiment.

It is related with stability, endurance, and creep resistance corrective strategy of a hardened material given in said either using a hardenability constituent which contains an organic tin catalyst (D) further as a dasirable embodiment. 0043

The 3rd is an organic polymar which has a silicon containing functional group which can construct a unctional group which can construct a bridge by forming a siloxane bond, and has it 1.7-5 pieces. andurance, and creep resistance corrective strategy of a hardened material using a hardenability oridge by forming a siloxane bond of this invention, This organic polymer is related with stability, constituent which is an organic polymar (A2) which averages per molecule a silicon containing

desirable embodiment. It is related with stability, endurance, and oreep resistance corrective strategy A silicon containing functional group which can construct a bridge by forming a siloxane bond as a of a hardened material given in the above using on silicon a hardenability constituent which is a

An organic polymer in which an organic polymer which has a silicon containing functional group which silicon containing functional group which has three or more hydrolytic bases

can construct a bridge by forming a siloxane bond as a desirable embodiment introduced an unsaturation group into an end, and general formula (1):

4-(SIR1 2-6 X, O) __-SIR2 3-g X, (1)

different. When the Tori ORGANO alloxy group shown by aryl group of the carbon numbers 6-20, an aralkyl group of tha carbon numbers 7–20, or (R) $_3$ SiO– is shown and R 1 or two or more R 2 exist, an alkyl group of the carbon numbers 1-20 from which Rith formula and R2 were the same as or

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numbara 1-20 hers, and thraa R' may be the same and may differ. X shows a hydroxyl group or a hey may be the same and may differ. It is a hydrocarbon group of monovalence of the carbon

ydrolytic basis, and when two or more X exists, they may be the sama and may differ. As for a, 0, 1, nay differ, m shows an integer of 0 to 19, however — what satisfies a+sigma b>=1 — carrying out t is related with stability, endurance, and creep resistance corractive strategy of a hardened material given in said either using a hardenability constituent which is an organic polymer obtained by an 2, or 3b shows 0, 1, or 2, respectively. About b in m bases (SiR¹ 2-bX_bO), they may be the same and addition reaction with a hydrosilane compound expressed. An organic polymer in which an organic polymer which has a silicon containing functional group which oan construct a bridge by forming a siloxane bond as a desirable embodiment introduced an

insaturation group into an end, and general formula (2):

hardened material given in said either using a hardenability constituent which is an organic polymer X in a formula shows a hydroxyl group or a hydrolytic basis, and three X may be the same and) it may differ. It is related with stability, endurance, and creep resistance corrective strategy of a obtained by an addition reaction with a hydrosilane compound axpressed.

The 4th is an organic polymer which has a silicon containing functional group which can construct a

bridge by forming a siloxane bond of this invention, and this organic polymer is a general formula (3). : -O-R3-CH(CH3)-CH2-(SIR1 2-bXb0) __-SIR2 3-2X_ (3)

chosen from a group which consists of hydrogen, oxygen, and nitrogen as a composition atom) [show R^{3In formula} a divalent organic group of the carbon numbers 1-20 which contain one or more sorts and] R1, R2, X, a, b, and m — the above — it is the same — it is related with stability, endurance, and creep resistance corrective strategy of a hardened material using a hardenability constituent

which is an organic polymer (A3) which has a structure part with which it is expressed.

An organic polymer which has a silicon containing functional group which can construct a bridge by orming a siloxane bond as a desirable embodiment is a general formula (4). :

-0-R3-C(CH3) =CH2 (4)

An organic polymer which introduced an unsaturation group expressed with $(\mathbb{R}^3$ is the same as the

t is related with stability, endurance, and creep resistance corrective strategy of a hardened material +(SiR1 2-bXb0) m-SiR2 3-aX (1) above), and general formula (1):

given in the above using a hardanability constituent which is an organic polymar obtained by an addition reaction with a hydrosilans compound expressed with $(R^{1})^{n}$ formula , R^{2} X, a, b, and m are tha An organic polymer which has a silicon containing functional group which can construct a bridge by same as the above).

R^{3in formule} and X are the same as the above.) --- it is related with stability, endurance, and orcep forming a siloxane bond as a desirable embodiment is a general formula (5).: -0-R3-CH(CH3)-CH2-SIX3 (5)

resistance corrective strategy of a hardened material given in said either using a hardenability constituent which is an organic polymer which has a structure part with which it is expressed.

forming a siloxane bond as a desirable embodiment. It is related with stability, andurance, and creap resistance corrective artistay of a fundred end material given in said aither usels for a principal chain sfeeleton. It handensility constituent which is an organic polymer which does not contain an amide An organic polymer which has a silicon containing functional group which can construct a bridge by segment (-NH-CO-) aubatantially. [0052] http://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_eije?atw_u=http%3A%2F%2Fwww4.ipdl.i. 2010/04/30

P.4101632,B [DETAILED DESCRIPTION]

A siticon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (6):

formula, respectively.) — it is related with stability, anduranca, and craep realstance corrective strategy of a hardened material given in said either using a hardenability constituent which is a basis three R4 is an organic group of monovalence of the carbon numbers 2-20 independently among a

It is related with stability, endurance, and creep resistance corrective strategy of a hardened material forming a siloxane bond uses a hardenability constituent which is a triethoxy silvl group as a desirable given in said either, wherein a silicon containing functional group which can construct a bridge by

strategy using on ailicon an organic polymer (A1) which is a silicon containing functional group which The 5th is an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond of this invention. A silicon containing functional group which can construct a bridge by forming a siloxane bond is related with thin layer hardenability corrective

has three or more hydrolytic bases, and a hardenability constituent containing an organic tin catalyst

An organic polymer (A) which has a silicon containing functional group which can construct a bridge precision-mechanical-equipment assemblies, a sealing material for direct grazing, a sealing material when the 6th forms a siloxane bond of this invention. And adhesives for interior panels containing for multiple glass, a scaling material for speed signal generator construction methods, or a sealing silicate (B), Adhesives for face panels, adhesives for tiling, adhesives for stone tensions, ceiling adhesives for car panels, the electrical and electric equipment, an electron and adhesives for finishing adhesives, it is related with floor finishing adhesives, adhesives for finishing of wall,

material for working joint of a building.

sealing material for multipla glaas, a sealing material for speed signal ganerator construction methods. The 7th is an organic polymer which has a silicon containing functional group which can construct a construct a bridge by forming a siloxane bond, . It is characterized by containing an organic polymer bridge by forming a siloxane bond of this invention, A silicon containing functional group which can silicon. Adhesives for interior pariels, adhesives for face panels, adhesivas for tiling, adhesives for stone tensions, Ceiling finishing adhesives, floor finishing of wall. adhesives for precision—mechanical—equipment assemblies, a scaling material for direct grazing, a adhasives for car panels. It is related with the electrical and alactric equipment, an electron and A1) which is a silicon containing functional group which has three or more hydrolytic bases on or a sealing material for working joint of a building.

polymerization method (meta) to the above by which it is characterized A description, Adhesives for A main chain of an organio polymer (A1) which has a silicon containing functional group which can construct a bridge by forming a silexane bend as a desirable embodiment. Using a hardenability constituent which is an acrylic ester system copolymer manufactured by a living-radical-

nechanical-equipment assemblies, a scaling material for direct grazing, a sealing material for multiple finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels. nterior panels, achesives for face panels, adhesives for tiling, adhesives for stone tensions, Ceiling glass, a sealing material for speed signal generator construction methods, or a scaling material for it is related with the electrical and electric equipment, an electron and adhesives for precisionworking joint of a building. As a desirable embodiment, containing silicate (B) further to said either by which it is characterized A description, Adhoeivos for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone tensions, Celling finishing adhesives, adhesives, adhesives for finishing of wall, adhesives for car panels, It is related with the electrical and electric equipment, an electron and http://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl.i.. 2010/04/30

sealing material for multipla glass, a saaling material for speed signal generator construction methods, idhesives for precision-mechanical-equipment assemblias, a sealing material for direct grazing, a or a sealing material for working joint of a building.

grazing, a sealing material for multiple glass, a scaling material for speed signal generator construction iling, adhesives for stona tensions, Ceiling finishing adhesives, floor finishing adhesives, adhesives for a desirable embodiment, containing carboxylic acid tin salt (C) further to said either by which it is sleatron and adhesives for precision-mechanical-equipment assemblies, a sealing material for direct inishing of wall, adhesives for car panels, it is related with the electrical and electric equipment, an characterized A description, Adhesives for interior panels, adhesives for face panels, adhesives for nethods, or a sealing material for working joint of a building

finishing of wall, achiesives for air panels, it is related with the electrical and electric equipment, an electron and arbitrates for president—methandural equipment assembles, a sealing matchial for effects againgt a sealing matchial for the sealing matchial for speed signal generator construction. jing, adhesives for stone tensions. Ceiling finishing adhesives, floor finishing adhesives, adhesives for As a desirable embodiment, containing an organic tin catalyst (D) further to said either by which it is characterized A description, Adhesives for interior panels, adhesives for face panels, adhesives for nethods, or a sealing material for working joint of a building.

oridge by forming a siloxane bond of this invention. It is characterized by this organic polymer being nechanical-equipment assemblies, a sealing material for direct grazing, a sealing material for multiple an organic polymer (A2) which averages per molecule a silicon containing functional group which can he 8th is an organic polymer which has a silicon containing functional group which can construct a construct a bridge by forming a siloxane bond, and has it 1.7-5 pieces. Adhesives for interior panels, glass, a scaling material for speed signal generator construction methods, or a scaling material for adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels, it is adhesives for face panels, adhesives for tiling, adhesives for stone tensions, Calling finishing elated with the electrical and electric equipment, an electron and adhesives for precision-

nechanical-equipment assemblics, a sealing material for direct grazing, a sealing material for multiple nterior panels, adheeives for face panels, adhesives for tiling, adhesives for stone tensions, Celling finishing adheaives, floor finishing adhesives, adhesives for finishing of wall, adhesives for car panels, A silicon containing functional group which can construct a bridge by forming a siloxane bond as a pass, a sealing material for apaed aignal generator construction methods, or a sealing material for hydrolytic bases on silicon to the above by which it is characterized A description, Adhesives for It is related with the slectrical and alectric equipment, an electron and adhesives for precisiondesirable embodiment. That it is a silicon containing functional group which has three or more vorking joint of a building. working joint of a building.

An organic polymer in which an organic polymer which has a silicon containing functional group which an construct a bridge by forming a siloxane bond as a desirable embodiment introduced an insaturation group into an end and a general formula (1):

+(SIR¹_{2-b}X_bO)_m-SIR²_{3-a}X_a (1)

That it is an organic polymer obtained by an addition reaction with a hydrosilane compound expressed iling, adhesives for stone tensions. Ceiling finishing adhesives, floor finishing adhesives, adhesives for grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction inishing of wall, adhesives for car panels. It is related with the electrical and electric equipment, an electron and adhesives for precision-mechanical-equipment assemblies, a sealing matarial for direct characterized A description, Adhesives for interior panels, adhesives for face panels, adhesives for vith (R^{1In formula}, R², X, a. b. and m are the same as the above) to said either by which it is

An organic polymer in which an organic polymer which has a silicon containing functional group which nethods, or a sealing material for working joint of a building.

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working joint of a building.

JP.4101632.B [DETAILED DESCRIPTION]

pan construct a bridge by forming a siloxane bond as a desirable embodiment introduced an unsaturation group into an end and a general formula (2): That it is an organic polymer obtained by an addition reaction with a hydrosilane compound expressed description, Adhesives for interior panels, adhesives for face panels, adhesives for tiling, adhesives for sealing material for multiple glass, a sealing material for speed signal generator construction methods. stone tensions, Ceiling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a adhesives for car panels, it is related with the electrical and electric equipment, an electron and with (X in a formula is the same as the above) to said either by which it is characterized A or a sealing material for working joint of a building.

bridge by forming a siloxane bond of this invention, and this organic polymer is a general formula (3). : The 9th is an organic polymer which has a silicon containing functional group which can construct a -O-R3-CH(CH3)-CH2-(SIR1 2-6XbO) -SIR2 3-8X (3)

It is characterized by being an organic polymer (A3) which has a structure part expressed with (R lin formula, R², R³, X, a, b, and m are the aame as the above). Adhesives for interior panels, adhesives for assemblies, a sealing matarial for direct grazing, a sealing matarial for multipla glass, a scaling material for speed aignal ganerator construction methods, or a scaling material for working joint of a building. electrical and electric equipment, an electron and adhesives for precision-mechanical-equipment finishing adhesives, adhasives for finishing of wall, adhesives for car panels, It is related with the face panels, adhesives for tiling, adhesives for stone tensions, Ceiling finishing adhesives, floor

An organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (4). -0-R1-C(OH2) =OH3 (4)

An organic polymer which introduced an unsaturation group expressed with (R is the same as the H-(SiR²_{2-b}X_bO) _m-SiR³_{3-a}X_a (1) above), and general formula (1):

That it is an organic polymer obtained by an addition reaction with a hydrosilane compound expressed characterizod A description, Adhesives for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone tensione. Celling finishing adhesives, floor finishing adhesives, adhesives for grazing, a sealing material for multiple glass, a sealing material for apoed algnal generator construction electron and adheaivas for pracision-mechanical-equipment assemblies, a sealing material for direct finishing of wall, adhesives for oar panels, it is related with the electrical and alectric equipment, an with (R^{2in formula}, R³, X, a, b, and m are the same as the above) to the above by which it is

An organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is a general formula (5). : -0-R1-CH(CH,)-CH,-SIX, (5)

methods, or a sealing material for working joint of a building.

related with the electrical and clectric equipment, an electron and adhesives for precision— mechanical—equipment assembles, a sealing material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction methods, or a sealing material for adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for oar panels, it is (Rin formula and X are the same as the above.) — a description to said either being an organic polymer which has a structure part with which it is expressed. Adhesives for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone tonsions. Geiling finishing

An organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment. That it is an organic polymer which does not

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dhesives for tiling, adhesives for stone tensions, Ceiling finishing adhasivaa, floor finishing adhesives. adhesives for finishing of wall, adhasives for car panels, It is related with the electrical and electric contain an amide segment (-NH-CO-) substantially in a principal chain skeleton to said either by naterial for direct grazing, a sealing material for multiple glass, a sealing material for speed signal quipment, an electron and adhesives for precision-mechanical-equipment assemblies, a sealing which it is characterized A description, Adhesives for interior panels, adhesives for face panels,

A silicon containing functional group which can construct a bridge by forming a siloxanc bond as a desirable embodiment is a general formula (6). :

enerator construction methods, or a sealing material for working joint of a building.

Adhesives for interior panels, adhesives for face panels, adhesives for tiling, adhesives for stone R⁴in farmula is the same as the above.) — a description to said either being a basis expressed, - SKOR*) 3 (6)

ealing material for multiple glass, a sealing material for speed signal generator construction methods, idhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a idhesives for car panels. It is related with the electrical and electric equipment, an electron and tensions, Ceiling finishing adhesives, floor finishing adhesives, edhesives for finishing of wall, or a sealing material for working joint of a building.

tescription, Adhesives for interior panels, achesives for face panels, adhesives for tiling, adhesives for sealing material for multiple glass, a sealing material for speed signal generator construction methods, A silicon containing functional group which can construct a bridge by forming a siloxane bond as a sestrable embodiment, That it is a triethoxy silyl group to said either by which it is characterized A stone tensiona, Geiling finishing adhesives, floor finishing adhesives, adhesives for finishing of wall, adhesives for precision-mechanical-equipment assemblies, a sealing material for direct grazing, a adhosives for oar panels, it is related with the electrical and electric equipment, an electron and or a sealing material for working joint of a building

The 10th is an organic polymer which has a silicon containing functional group which can construct a oridge by forming a siloxane bond of this invention, A silicon containing functional group which can

As a desirable embodiment, silicata is ralatad with a hardenability constituent given in the above construct a bridge by forming a siloxane bond is related with an organic polymer (A1) which is a silicon containing functional group which has three or more hydrolytic bases on silicon, and a nardenability constituent containing silicate (B).

seing a condensate of tetra sikoxysilane.

silicon containing functional group which has three or more hydrolytic bases on silicon, and a hardenability constituent containing carboxylic acid tin salt (C1) whose carbon of an alpha position of The 11th is an organic polymar which has a silicon containing functional group which can construct a bridge by forming a siloxane bond of this invention, A silicon containing functional group which can construct a bridge by forming a siloxane bond, it is related with an organic polymer (A1) which is a carboxyl group is the 4th class carbon. The 12th is an organic polymer which has a silicon containing functional group which can construct a construct a bridge by forming a siloxane bond is related with an organic polymer (A1) and carboxylic vidge by forming a siloxane bond of this invention, A silicon containing functional group which can acid tin salt (C) which are the silicon containing functional groups which have three or more

hydrolytic bases on silicon, and a hardenability constituent containing an organic tin catalyst (D).

The 13th is an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond of this invention, A silicon containing functional group which can construct a bridge by forming a siloxane bond is related with an organic polymer (A1) which is a ilicon containing functional group which has thrae or more hydrolytic bases on silicon, and a nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_egi-ejje?atw_u=http%3A%2F%2Fwww4.ipdl... 2010/04/30

ardenability constituent containing a non-tin oatalyst (E).

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The 14th is an organic polymer which has a silicon containing functional group which can construct a oridge by forming a siloxane bond of this invention, A silicon containing functional group which can construct a bridge by forming a siloxana bond ia related with an organic polymar (A1) which is a silicon containing functional group which has three or more hydrolytic bases on silicon, and a

nardenability constituent containing a minute hollow body (F).

he 15th is an organic polymer which has a silicon containing functional group which can construct a polymer (A1) which is a silicon containing functional group which has three or more hydrolytic bases on silloon, and is related with a hardenability constituent, wherein this organic polymer is 5 to 28 % of construct a bridge by forming a siloxane bond, it is a hardenability constituent containing an organic bridge by forming a siloxane bond of this invention, A silicon containing functional group which can the weight in a total amount of a hardenability constituent. An organie polymer in which an organie polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment introduced an unsaturation group into an end, and general formula (2): It is related with a hardenability constituant given in aaid aithar being an organic polymer obtained by an addition reaction with a hydrosilane compound expressed with (X in a formula is the same as the

A silicon containing functional group which can construct a bridge by forming a alloxanc bond as a desirable embodiment is a general formula (6). :

It is related with a hardenability constituent given in said either being a basis expressed with (R⁴ⁱⁿ formula is the same as the above).

containing functional group which can construct a bridge by forming a siloxane bond of this invention. A silicon containing functional group which the 16th is an organic polymer which has a silicon and can construct a bridge by forming a siloxane bond is a general formula (6).: An organic polymer (A4) which has a basis expressed with (R^{4in formula} is the same as tha above), and general formula (7):

- SiR5 (OR®) 3-0 (7)

- Si(OR⁴)₃ (6)

formula, respectively, and $3-c\ R^3$) it is an organic group of monovalence of the carbon numbers 2-20which storage stability containing an aminosilane coupling agent (G) which has a basis expressed has independently, and a shows 0, 1, or 2, respectively. It is related with a hardenability constituent in c R⁵ is an organic group of monovalence of the carbon numbers 1-20 independently among a

A silboon containing functional group which the 17th is an organic polymer which has a silboon containing functioning group which an constructe a brigge by forming a silboare board of this invention, and can construct a bridge by forming a silboare board of this invention, and can construct a bridge by forming a silboare board is general formile (0).

[0081]

An organic polymer (A4) which has a basis expressed with (R^{4in formula} is the came as the above), and

(OCH₃) (OR³) 3-4-8 (8) general formula (8):

numbers 2-20 independently, respectively, d shows 0, 1, or 2 and e shows 1, 2, or 3.) However, 3-dformula, respectively, R⁸ of a 3-d-e individual is an organio group of monovalence of the carbon (d R⁷ is an organic group of monovalance of the oarbon numbera 1-20 independently among a

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>>=0 shall be satisfied. It is a hardenability constituent containing an sminosilane coupling agent (H) which has a basis exprassed, and is related with a hardensbility constituent in which a cure rate ecuperating oneself beforehend in this hardensbility constituent has been improved.

containing functional group which can construct a bridge by forming a siloxane bond of this invention, A silicon containing functional group which the 18th is an organic polymer which has a silicon and can construct a bridgs by forming a siloxane bond is a general formula (6). :

is related with an organic polymer (A4) which has a basis expressed with (R4in formula is the same

A silicon containing functional group which the 19th is a polyoxyalkylene series polymer which has a

is the above), and a hardenability constituent containing epoxy resin (I).

silicon containing functional group which can construct a bridge by forming a siloxane bond of this invention, and can construct a bridge by forming a siloxane bond is a general formula (6).

A polyoxyalkylene series polymer (A5) which has a basis expressed with (R4in formula is the same as copolymer (A6) which has a silicon containing functional group which can construct a bridge by he above), And it is related with a hardenability constituent containing an acrylic ester system orming a siloxane bond (mets).

which has a silicon containing functional group which can construct a bridge by forming a siloxane bond of this invention, and can construct a bridge by forming a siloxane bond is a general formula (6). A silicon containing functional group which the 20th is a seturated hydrocarbon systam polymar

t is related with a hardenability constituent containing a saturated hydrocarbon system polymer (A7) SKOR⁴)₃ (6)

which has a basis expressed with (R^{4th} formula is the same as the sbove).

4 silicon containing functional group which the 21st is an acrylic ester system copolymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond of this nvention (meta), and can construct a bridge by forming a siloxene bond is a general formula (6). :

t is related with a hardenability constituent containing an acrylic ester system copolymer (A8) which nas a basis expressed with (R4III formula is the same as the above) (meta). - SI(OR4) 3 (6)

An organic polymer in which an organic polymer which has a silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment introduced an

it is related with a hardenability constituent given in said either being an organic polymer obtained by unsaturation group into an end, and general formula (9): H-Si(OR4), (9)

an addition reaction with a hydrosilane compound expressed with (being the same as the R⁴in formula

forming a siloxane bond as a desirable embodiment, it is related with a hardenability constituent given An organic polymer which has a silicon containing functional group which can construct a bridge by in said either being an organic polymer which does not contain an smide segment (-NH-CO-) 0087

substantially in a principal chain skeleton.

A silicon containing functional group which can construct a bridge by forming a siloxane bond as a desirable embodiment is related with a hardenability constituent given in said either being a triethoxy

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containing functional group which can construct a bridge by forming a siloxane bond of this invention, A silicon containing functional group which the 22nd is an organic polymer which has a silicon and oan construct a bridge by forming a siloxane bond is a general formula (6).

General formula (10) carrying out the ester exchange reaction of the compound (J) which has at least ona methoxy group which can carry out an estar axchange reaction to an organic polymer (A4) which has a basis expressed with (R4in formula is the same as the above): - Si(OCH₃) (OR⁴) 3-4 (10)

independently, respectively, and f shows 1, 2, or 3.) — it is related with a manufacturing method of an among a formula, 3-f R4 is an organic group of monovalence of the carbon numbers 2-20 organic polymer which has a basis expressed

lereafter, this invention is explained in detail.

Restriction in particular does not have a principal chain skeleton of an organic polymer (A) which has a reactive silicon group used for this invention, and it can use a thing with various kinds of principal 0091

outyl (meta) acrylate (meta); (meta) An acrylic ester system monomer, vinyl acetate, acrylonitrile, A polymerization of adipic acid and hexamethylenadiamina, and sebsoic acid, Nylon 11 by condensation /inyl-base polymer produced by carrying out the radical polymerization of the monomers, such as styrene; A vinyl monomer in inside of said organic polymer is polymerized. Graft polymer, obtained. Polysulfide system polymer. Wylon 610 by condensation polymerization of nylon 6 by ring opening polymerization of epsilon caprolactam, hexamethylenediamine, Wylon 66 by condensation polymers; Condensation with dibasic acid, such as adipic acid, and glycol, Or s polyester system polymer obtained by ring opening polymerization of lactone; Ethyl (meta) acrylate, An acrylic ester system copolymer produced by carrying out the radical polymerization of the monomers, such as polyisoprene, isoprene or butadiene, acrylonitrila, etyrene, etc., A copolymor with polybutadiene, isoprene or butadiene, acrylonitrile, styrene, etc., Hydrocarbon system polymers, such as a ydrogenation polyolefine system polymer produced by hydrogenating these polyolefine system Specifically A polyoxyethylene, polyoxypropylene, polyoxy butylene, Polyoxy tetramethylen, a copolymer of polyisobutylene, isobutylene, isoprene, etc., polychloroprene, A copolymer with solyoxypropylene polyoxy butylene copolymer, An ethylene-propylene system copolymer, A colyoxyethylene polyoxypropylene copolymer, Polyoxyalkylene series polymers, such as a

system copolymer have a comparatively low glass transition temperature, and their hardened material Saturated hydrocarbon system polymers, such as polyisobutylene, hydrogenation polyisoprene, and sydrogenation polybutediene, and a polyoxyalkylene series polymer and an acrylic ester (meta) obtained is preferred especially from excelling in cold resistance.

oopolyamide, A dialiyi phthalate system polymer etc. are illustrated. A polyoxyalkylene series polymer

copolymer, a polycarbonste system polymer, etc. are preferred from acquisition and manufacture

being easy among polymers with the sboyc-mentioned principal chain skeleton.

a hydrocarbon system polymer, a polyester system polymer, an acrylic ester (meta) system

poening polymerization of epsilon-amino RAURO lactam, and the above-mentioned nylon, such as

carrying out condensstion polymerizstion from polyamida aystem polymar, for example, bisphenol A,

and carbonyl chlorides which have a two or more-ingredient ingredient among Nylon 12 by ring

polymerization of epsilon-aminoundecanoic acid, A polycarbonate system polymer manufactured by

in a principal chain skeleton of the above-mentioned organic polymer (A), other ingredients, such as a prethane bond ingredient, may be included in the range which does not spoil an effect of this invention greatly.

tt is not limited aspacislly as the above-mentioned urethane bond ingrediant, but For example, toluene (tolylene) diisocyanste, Aromatic system polylaocyanatss, such as diphenylmethane 2010/04/30 http://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl.i..

oolyisocyanate compounds, such as aliphatio series system polyisocyanatas, auch as haxamethylene di-isocyanate, and polyol which has various kinds of above-mentioned principal chain skeletons can be mentioned.

urethane bond, viscosity of an organic polymer will become high and will serve as a bad constituent of if there are many amide segments (-NH-CO-) generated in a principal chain skalaton based on said workability. Therefore, as for quantity of an amide segment occupied in a principal chain skeleton of an organic polymer, it is preferred that it is 3 or less % of the weight, it is more preferred that it is 1 or less % of the weight, and it is most preferred that an amide segment is not included substantially A reactive silicon group contained in an organic polymer which has a reactive silicon group is a basis which can construct a bridge by forming a siloxane bond by the reaction which has a hydroxyl group or a hydrolytic basis combined with a silicon atom, and is accelerated by a silanol condensation

catalyst. As a reactive silicon group, it is a general formula (11). : -(SIR1 2-bX60) __-SIR2 3-2X3 (11)

hydrolytic basis, and when two or more X exists, they may be the same and may differ. As for a, 0, 1, nay differ. m shows an integer of 0 to 19, however — what satisfies a+sigma b>=1 — carrying out or 3b shows 0, 1, or 2, respectively. About b in m bases (SiR¹ 2-bX_bO), they may be the same and ifferent. When the Tori ORGANO siloxy group shown by anyl group of the carbon numbers 6-20, an aralkyl group of the carbon numbers 7-20, or (R) ₃SiO- is shown and R¹ or two or more R² exist, numbers 1-20 here, and three R' may be the same and may differ. X shows a hydroxyl group or a hey may be the same and may differ. R is a hydrocarbon group of monovalence of the carbon an alkyt group of the carbon numbers 1–20 from which R¹in formula and R² were the same as or a basis expressed is raised.

these, a hydrogen stom, an altoxy group, an soyloxy group, a KETOKISHI mists group, an amino group, an amino group, an amino group, and an antide group, and an altowyloxy group are preferred, hydrolysis nature is quiet and a viowpoint of handling or a conto to especially an altoxy group is hydrolysis nature is quiet and a viowpoint of handling or a conto to especially an altoxy group is cyloxy group, a KETOKISHI mate group, an amino group, an amide group, an acid-amide group, an sspecially as a hydrolytic basis. Specifically, a hydrogen atom, a halogen atom, an alkoxy group, an minooxy group, a sulfhydryl group, an alkenyloxy group, etc. are mentioned, for example. Among t is not limited but what is necessary is just a conventionally publicly known hydrolytic basis

4 hydrolytic basis and a hydroxyl group can be combined with one silicon atom in the 1-3 ranges, and (a+sigmab) has 1-5 preferred ranges. When a hydrolytic basis and a hydroxyl group join together in two or more] a reactive silicon group, they may be the same and may differ.

in particular, it is a general formula (12).:

3-x (12)

(R2 and X are the same as the above among a formula.) Since a resctive silicon group expressed with an integer of 1-3 is easy to receive, a's is preferred.

anakyi groups, such as anyi groups, such as cycloalkyi groups, such as alkyi groups, such as a methyi group and an ethyi group, and a cyclohexyi group, and a phenyi group, and benzyi, the Tori ORGANO sloxy group R' is indicated to be by 3SIO-which is a methyl group, a phenyl group, etc. (R'), etc. are As an example of R1 in the above-mentioned general formula (11) and (12), and R2. For example, aised. Especially in these, a methyl group is preferred.

roup, a triisopropoxy silyl group, a dimathoxymethyl ailyl group, a diethoxymethylsilyl group, and a As more concrete illustration of a reactive silicon group, a trimathoxysilyl group, a triethoxy silyl

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disopropoxy methyl silyl group ara mentioned.

especially in this invention, an organic polymer which has the silicon containing functional group (that is, the number of a+bxm of a genaral formula (11) is three or more) which three or more hydrolytic

silicon, and constructed the bridge by a silanol condensation reaction of that reactive silicon group. bases combined on silicon in an organic polymer of the (A) ingredient can be used as an ingredient A hardened material which three or more hydrolytic bases had combined this (A1) ingredient on

(A1) As for the number of a+bxm of a general formula (11) of an ingredient, it is more preferred that it Good stability is shown and remarkable creep resistance and an endurance improvement effect are shown as compared with a case of reactive silicon group containing organic polymer which has two or is 3-5, and especially 3 is preferred. Also in it, since [that its improvement effect of the stability of a alkoxyl group of the carbon numbers 1-20 is preferred, its thing of the carbon numbers 1-10 is more hardenability constituent of this invention, endurance, and creep resistance is especially large and I the Tori alkoxy sityl groups has the good availability of a raw material, it is preferred. Thing of an preferred, and its thing of the carbon numbers 1-4 is still more preferred here. Specifically, a vimethoxysilyl group and a triethoxy silyl group are the most preferred. Hardensbility may become ess hydrolytic bases.

containing organic polymer in a hardenability constituent. Therefore, five to 28% of the weight, when it **. However, if an ingredient (A1) of this invention is used as reactive silicon group containing organic is 15 to 24 % of the weight especially preferably, since a rate of an ingredient (A1) in a hardenability constituent is compatible in low cost and high endurance, it is more preferably preferred [rate] ten constituent becomes low, it is known that the endurance of a hardened material obtained will fall to polymer, high endurance is maintainable even if it makes low weight % of reactive silicon group Generally, if weight % of reactive allicon group containing organic polymer in a hardenability

late when a carbon number is larger than 20.

numbers 2-20 can be used as a (A4) ingredient in an organic polymer of an ingredient (A1). Namely, Especially in this invention, an organic polymer which has the Tori alkoxy silyl groups of the carbon general formula (6): 0107

to 26% of the weight.

three R4 is an organic group of monovalence of the carbon numbers 2-20 independently among a formula, respectively.) -- an organic polymer which has a basis expressed can be used as a (A4)

ingredient

It is known that methanol generated in connection with a hydrolysis reaction of a methoxy sily! group number of an alkoxy group which combines the (A4) ingredient with a silicon atom is 2 to 20, toxic high methanol is not contained in alcohol generated in connection with a hydrolysis reaction of a has peculiar toxicity of causing an obstacle of an optic nerve. On the other hand, since a carbon reactive silicon group, but serves as a constituent with high safety at it.

generated by hydrolysis has the highest safety, it is the most preferred (as for a carbon number of (A4) It is preferred that it is especially 2-4, and when it is 2, it serves as ethanol, and since alcohol

Specifically, a tricthoxy silyl group is the most preferred. When a carbon number is larger than 20, while the hardenability of a hardenability constituent may become late, an anesthetic action and R4 of a general formula (6) of an ingredient, it is more preferred that it is 2-10, and / alcohol].

Especially in this invention, a principal chain skeleton can use as a (A5) ingradient what is oolyoxyalkylene in an organic polymer of the (A4) ingrediant. Namely, general formula (6):

stimulation of alcohol to generate may be large.

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A polyoxyalkylene series polymer which has a basis exprassed with (R4in formula is the same as the above) can be used as a (A5) ingredient.

effective network chain density of an organic polymer (A) ingredient contained in a hardened material 1.1-5 reactive silicon groups of an organic polymer (A) exist preferably [that everage per molecule and at least one piece exists], and more preferably. If the number of reactive silicon groups silicon group may exist in an end of an organic polymer (A) chain, and may exist in an inside. Since brmed eventually will increase if a reactive silicon group exists in an end of a chain, a rubber-like hardened material in which a low elastic modulus is shown becomes is easy to be obtained by high pecome insufficient and will become difficult to reveal a good rubber elasticity action. A reactive contained in one molecule of organic polymers (A) will be less than one piece, hardenability will ntensity and high elongation.

Especially in this invention, an organic polymer the number of reactive silloon groups per molecule averages, and 1,7–5 pieces exist in an organic polymer of the (A) ingredient can be used as an ngredient (A2).

reaction of that reactive silicon group, Good stability is shown, the number of reactive silicon groups ber molecule averages, and ramarkabla creep resistance and an endurance improvement effect ara A hardened material which the number of reactive ailicon groups per molecule averaged this (A2) ngredient for it, and 1.7-5 piacea existed, and constructed the bridge by a silanol condensation shown as compared with a case of less than 1.7 organic polymers.

that they are 2-4 picces, and it is preferred that they are especially 2,3-3 pieces. When there are few (A2) As for the number of reactive silicon groups per molecule of an ingredient, it is more preferred

constituent of this invention, endurance, and creep resistance may not be enough, and when larger .7 reactive silicon groups per molecule, an improvement effect of the stability of a hardenability than five pieces, elongation of a hardened material obtained may become small.

Especially at this invention, it is a general formula in an organic polymer of the (A) ingredient (3). : O-R3-CH(CH3)-CH2-(SIR1 2-6X6O) _ -SIR2 3-4X_ (3)

shosen from a group which consists of hydrogen, oxygen, and nitrogen as a composition atom) [show R^{3In formula} a divalent organic group of the carbon numbers 1-20 which contain one or more sorts and] R1, R2, X, a, b, and m -- the above -- it is the sama -- sn organic polymer which has a structure part with which it is axpressed can be used as a (A3) ingredient

A hardened material which this (A3) ingradient has a structure part expressed with a general formula shows good stability, and shows remarkable creep resistance and an endurance improvament effect as compared with a case of an organic polymer which has terminal structures other than a genoral 3), and constructed the bridge by a silanol condensation reaction of that reactive silicon group ormula (3).

As for a carbon number of R³ of a general formula (3), it is more preferred from a point of availability hat it is 1-10, and it is preferred that it is especially 1-4. Specifically, R³ has the most preferred methylene group.

(A3) An ingredient is a general formula (5). :

-0-R3-CH(CH3)-CH2-SIX3 (5)

(R3In formula and X are the same as the above.) — when it is an organio polymer which has a structura part with which it is expressed, since [that an improvement effect of tha stability of a hardenability constituent of this invention, endurance, and creep resistance is especially large and I the availability

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of a raw material is good, it is desirable.

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(A) What is necessary is just to perform introduction of a reactive silicon group of an ingredient by a

publicly known method. That is, the following methods are mentioned, for example.

reactivity to an organic polymer which has functional groups, such as a hydroxyl group, in a molecule to this functional group react, and obtain an organic polymer containing an unsaturation group. Or an (b) Make an organic compound which has an active group and an unsaturation group which show

group content epoxy compound. Subsequently, hydrosilane which has a reactive silloon group is made unsaturation group content organicity polymer is obtained by copolymerization with an unsaturation to act on an acquired resultant, and it hydrosilylates.

(**) Make a compound which has a sulfhydryl group and a reactive silicon group react to an organic polymer containing an unsaturation group produced by making it be the same as that of the (b)

reactivity to an organic polymer which has functional groups, such as a hydroxyl group, an epoxy (**) Make a compound which has a functional group and a reactive silicon group which show group, and an isocyanate group, in a molecule to this functional group react.

hydroxyl group react to an end a method of (b) or among (**)s in the above mathod is preferred. An polymer obtained by a method and an organic polymer obtained by a method of (≠€) have the strong Since a high inversion rate is obtained in comparatively short reaction time, a method of making a compound which has a polymar, an laccysnate group, and a resctive sillcon group which have a becoming a good hardenability constituent of workability by hypoviscosity rather than an organic organic polymer which has the reactive silicon group obtained by a method of (b), (**) Since oad smell based on an mercaptosilane, especially its method of (b) is preferred. (b) As an example of a hydrosilane compound used in a method, For example, trichlorosilane, methyldi chlorosilicane, dimethylchlorosilicane, Halogenation Silang like phenyl dichlorosilane; Trimethoxysilane, dimethoxysilane; Methyldi acetoxysilane. The acyloxy silanes like a phenyldiacetoxysilane; although KETOKGSHI mateλmethyleilane are raised, it is not limited to these. Espocially among these, preparation Slaing allowyselines are preferred, especially allowyselian has tre quiet hybrolysis nature of a hardenialiqui contestiquent obtained, and it is that most proferred to a handling and come the KETOKISHI mate silanes like bis(dimethyl KETOKISHI mate)methylsilane and bis(cyclohexyl Triethoxysilane, methyldiethoxysilane, methyl dimethoxysilane, The alkoxysilane like phenyl

In the sbove-mentionad hydrosilane compound, it is a general formula (2).

H-SiX, (2)

Since a hydrosilane compound expressed with (X in a formula is the ssme as the above) has an especially large improvement effect of the stability of a hardenability constituent which consists of an organic polymer obtained by an addition reaction of this hydrosilane compound, endurance, and creep resistance, it is preferred. In a hydrosilane compound expressed with a general formula (2), trialkoxysilane, such as trimethoxysilane, triethoxysilane, and a triisopropoxy silane, is more preferred.

group) of 1 also in said trialkoxysilane is like [when disproportionation may advance quiddby and proporportionation progresses 1 dinathoxysilane — a dangerous compound arises in inside. From a viewpoint of seriety on handling to a general (formula (B): trialkoxysilane in which carbon numbers, such as trimethoxysilane, have an alkoxy group (methoxy

It is preferred to use trialkoxysilans which has an alkoxy group whose carbon number axpressed with R4in formula is the same as the above) is two or more. A viewpoint of availability, safety [on nttp://www4.ipdl.inpit.go.jp/ogil-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwvw4.ipdli,... 2010/04/30

andling], stability [of a hardenability constituent obtained], endurance, and creep resistance ** to riethoxysilane is the most preferred.

exampla, etc. are mentioned, it is not limited in particular. As an example of a compound of having compound which has a auffhydryl group and a reactive silicon group as a synthetic method by a adical addition reaction under a radical initiator and/or radical source-of-release existence, for **) Although a method of introducing into an unsaturation binding site of an organic polymer a said suffhydryl group and a reactive silicon group. For example, although gamma-mercapto

propytumethoxysilane, gamma-mercaptpropylmethyl dimethoxysilane, gamma-mercaptopropyl ziethoxysilane, gamma-mercapto propylmethyl diethoxysilane, etc. are raised, it is not limited to

**) Aithough a method etc. which are shown in JP,H3-47825.A are mentioned, for example as a

nethod of making a compound which has a polymer, an isocyanate group, and a reactive silicon group particular. As an example of a compound of having said isocyanate group and a reactive silicon group, or example, although gamma-isocyanate propyltrimethoxysilane, gamma-isocyanate propylmethyl which have a hydroxyl group reacting to an end among synthetic methods, it is not limited in ilmethoxysilane, gamma-isocyanatepropyl triethoxyailane, gamma-isocyanate propylmethyl diathoxysilane, etc. are raised, it is not limited to these.

which especially carbon numbers, such as trimethoxysilane, have an alkoxy group (methoxy group) of As mentioned above, as for a silane compound which three hydrolytic bases have combined with one , disproportionation may advance quickly. If disproportionation progresses, a remarkable dangerous compound [like] which is dimethoxysilane will arise. However, such disproportionation advances in neither gamma-mercapto propyltrimethoxysilane nor gamma-isocyanate propyltrimethoxysilane. For silicon atoma, such as trimethoxysilane, disproportionation may advance, As for trialkoxysilane in

rimethoxysilyl group, as a silicon content group, it is preferred to use a synthetic method of (**!) or this reason, when using the Tori alkoxy silyl groups which has methoxy groups, such as a

As how to obtain an organic polymer which has the silicon content group combined with a methoxy group, it is one method of the above-mentioned (***), (***), and (***), and a reactive silicon group is a A compound (J) which has at least one methoxy group which can carry out an ester exchange zeneral formula (6): : - Si(OR⁴)₃ (6)

reaction after obtaining an organic polymer (getting it blocked the above-mentioned (A4) ingredient) which has a basis expressed with $(R^{\text{ell}}$ formula is the same as the above), it is a general formula by carrying out an exter exchange reaction under existence of a transesterification catalyst or

- Si(OCH₃) (OR*) 3-f (10) nonexistence (10); :

independently, respectively, and fishows 1, 2, or 3.) — a method of manufacturing an organic polymer which has a basis expressed can be mentioned. An organic polymer which has a basis expressed with general formula (10) shows fast curability rather than an organic polymer which has a basis among a formula, 3-f R4 is an organic group of monovalence of the carbon numbers 2-20 expressed with a general formula (6).

nanufacturing an organic polymer which has a basis expressed with a general formula (10), Without a (**), by carrying out an ester exchange reaction to the aforementioned (J) ingredient, A method of in said manufacturing method, after introducing a reactive silicon group especially by a method of

there are few bad smalls, and also since it becomes a good hardenshility constituent of workshility by yourselventy rather than an organic polymer obtained by a mathod of (44), it is more desirable than an organic polymer obtained by a method of (44), it is more desirable than an organic polymer obtained by a method of (44). dangerous compound like dimethoxysilane by disproportionation arising in the middle of manufacture,

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JP,4101632.B [DETAILED DESCRIPTION]

As a compound (J) which has at least one above-mentionad methoxy group which oan carry out an aster exchange reaction, there is no limitation in particular and various kinds of compounds can be

methoxy groups on the same silicon atom as a compound which has the silicon atom combined with especially a compound that has a silicon atom united with 2-4 methoxy groups on the same silicon A compound etc. which have the silicon atom combined with methyl ester of various kinds of acid. said at least one methoxy group has a quick ester exchange reaction speed, it is preferred. Since ngredient here can be mentioned. Since a compound which has the silicon atom unitad with 2-4 such as methanol, carboxylic soid, and sulfonic acid, and at least one methoxy group as a (J) stom and an amino group has a quick ester exchange reaction speed, it is preferred.

When it illustrates concretely, gamma-aminopropyl trimethoxysilane, gamma-aminopropyl methy propytrimethoxysilane, N-phenyl-gamma-aminopropyl trimethoxysilane, and N-benzyl-gammadimethoxysilane, gamma-(2-aminoethyl) aminopropyl trimethoxysilane, gamma-(2-aminoethyl) aminopropyl methyl dimethoxysilane, Amino group content Silang, such as gamma-ureido

Since an ester exchanga reaction advances also under existence of a transesterification oatalyst and comparatively low temperature conditions 60 ** or less, aforamentioned amino group content Silang thing of the above-mentioned silane compound can also use the above-mentioned silane compound as a (J) ingredient.

uninopropyl trimethoxysilane, can be mentioned. A denatured derivative and a condensation reaction

exchange reaction in 0.1-10 copies to 100 copies of reactive silicon group containing organic polymer of the (A4) ingredient. It is preferred to use it in 1-5 copies especially. The above-mentioned (J) As for the (J) ingredient used for this invention, it is preferred to use and carry out an ester ingredient may be used only by one kind, and may carry out two or more kind mixing use. is preferred. [0136]

branching, and the number average molecular weight is 1,000-30,000 more preferably 500 to about An organic polymer (A) which has a reactive silicon group may have straight chain shape or

50,000 in polystyrene conversion in GPC. When there is a tendency whose number average molecular woight is inconvenient in respect of the extension characteristic of a hardened material at less than 500 and 50000 is exceeded, since it becomes hyperviscosity, there is an inconvenient tendency in respect of workability.

molecular terminal, it is desirable from points, like a rubbar-like hardaned material of high elongation A reactive silicon group may be in an end or an inside of an organic polymer chain, and may be in nardened material formed eventually increases especially when a reactive silicon group is in a ooth. Since effective network chain denaity of an organic polymar component contained in a becomes is easy to be obtained with high intensity.

Said polyoxyalkylene series polymer is a general formula intrinsioally (13).

-R³-0-Formula 1]

alkylene group of the carbon numbars 1-14.) --- it being a polymer which has a repeating unit ahown, among a formula, R⁹ is a divalent organic group and is the straight chain shape or the branching and, R⁹ in a general formula (13) has the carbon numbers 1–14, and also preferred straight chain shape or branched state alkylene group of 2–4. As the exampla of the repeating unit shown by a http://www4.ipdl.inpit_go_jp/ogi-bin/tran_wcb_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl.i____2010/04/30

general formula (13).

** is mentioned. The principal chain stelects or polyoosystylevane sectio polymer may consist of one for for repeating unit, and may consist of two or more lived of repeating units. When used especially for each man set, it is destable from that what compress the polymer which uses a propytene could for man each me man impredients is amorphous, or the point which the set propytene could have a the media ingradients is amorphous, or the point which is hypothococally comparatively. an extraction and/or to above case the scribe power of a sold southern than the power of a sold southern than the scribe case of a sold southern than the sold southern the sold southern

A manufacture, effects, effect

4586007, and U.S. Pat. No. 498084f, JP.61-197831.A. 61-216822. 61-215823, Although 6,000 or more number everage melout weight and MANN with are proceed by each settle of 61-215882, Phyl-P-7252A, JP.H.9-4785A, and JP.H.9-7252A or militative a polycoyalkyma safers polymer with mirrow meleoatine weight detribution in the 1.6 or has amount of Polymer Division, it is not

finited to in particular these. Apploxyagation acting by the control of the contr Said staurated Indivocation system polymer is a polymer which does not contain substantially said staurated Indivocation system polymer is a polymer which does not contain a substantially said staurated by the deep than an aromatic large, and so have which makes the salestine. (I) Evidenter an eleftric compound of the cachen number 1-6 such as ethylene, salestine, the said soldstylene, is poperated as an emonemer, and soldstylene, in spiror sport and soldstylene, and soldstylene and sinceres. In soldstylene spiror should be a such soldstylene spiror should be such as the said soldstylene spiror should be such soldstylene spiror polymer and a hydrogenation polyherate soldstylene system polymer and a hydrogenation polyherated soldstylene system polymer and and tend to control a mobileular weight and one increase the number of and functional group them and, and tend to control a mobileular weight and one increase the number of ward functional group, they are preferred, and a composite ease to associatly their included.

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JP,4101632,B [DETAILED DESCRIPTION]

That whose principal chain skeleton is a saturated hydrocarbon system polymer has the feature which is excellent in heat resistance, weatherability, ondurence, and humidity interception nature reseases.

Urida All the monomeric units may be formed from an isobuchene unit, and an isobuchene system polymer. Although a copolymer with other monomers may be sufficient, what contains a repeating unit which originates is isobuchene from a field united proporty official the weight or more is preferred, when is contained 80% of the weight or more is more preferred, and suppossible white contained 90 to 98%.

of the weight is preferred.

As a synthetic medic of a saturated otherathen express no pointer, although widnes adventaged methods are reported conventionally, especially fivility polymerization what is sailed of recent years may be developed an inform polymerization (L.—Pokimization what is sailed of recent years may be developed an inform polymerization (L.—Pokimization was formed sub-fivient and with a featured information express no polymer, especially as instanted hybroardion system oplomer, especially as instanted hybroardion system oplomer, especially as instanted hybroardion system oplomer, especially as in section of a saturated hybroardion system oplomer, especially as in sub-fivient development of a sub-fivient solution. It is provided that the property of t

As a process of a saturated professorbun steam polymer with the sar assets elicino group. For countrie, 20,4-665681, I/P 1-1082881, I/P 5-254164A, Athiouth is write in man Description of 1744-25404, I/P 1-1082881, I/P 5-254164A, Athiouth is write in man Description of 1744-25404, I/P 1-108289, A Petent Gazzet of Section 20, I/P 1-108289, A Petent Gazzet of Section 20, I/P 1-108289, I/P 1-108

iu bz] It is a general formula in a saturated hydrocarbon system polymer which has the above—mentioned

reactive silicon group (6).:
- Si(OR⁴), (6)

Especially (A7) a saturated hydrocurbon system polymer that has a basis convessod with (cfee formals is easier as the open open as an impedent his (A7) gregorian that the feature which is excellent in heat resistance based on a saturated hydrocurbon system polymer, weathersafflet, and married hydrocurbon married as an immediate the compensation of the community hydrocurbon matter of a circuit color than the community of the compensation of the community hydrocurbon matter of a circuit color than the community of the compensation of a reacher adding married as to advince whose stability of a

[0153] A saturated hydrocarbon system polymer which has the above-montioned reactive silicon group may

nardened material, endurance, and creep resistance are still better.

Die used alone, and may be used together two or more sorts. Egspelally in this invention, a chain can use what is an acrylic ester (meta) system copolymer as an

ingredient (A6) in an organic polymer of the (A) ingradient.

0155

electrically as an accident effect of the control o

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auch as methacrylamide; Alkenes; butadiene, such as vinyl ester; ethylene, such as vinyl acetate, vinyl sster monomer (meta) more preferably, is an acrylic polymer which consists of acrylic ester monomor preferred other monomers, copolymerization, and also that may carry out block copolymerization and E-parfluoro decylethyl, and acrylic acid (meta) 2-perfluoro hexadacylethyl, atc. ara mantioned. In the forementioned (meta) acrylic ester system copolymer, copolymerization of the following vinyl system ster and dialkyl ester of maleic acid and maleic acid; Fumaric acid, Monoalkyl ester and dialkyl ester preferably especially, and is a polymer which consists of butyl acrylatas atill mora prafarably. A point that physical properties, such as hypoxinosety of a compound, a low modulus of a leardened material light charged on the statementality, and hast resistance, are required in a use of general *********** to a butyl sarybus system monemer is still more proferred. A copolymer mally concerned with ethyl sorylate is excellent in oil resistance. However, since it follows on increasing a ratio of butyl acrylate nonomers in that case, Acrylic acid (meta) expresses acrylic acid and/, or methacrylic acid with the monomers, such as KURORU atyrans, styrens sulforio soid, and its salt, Parfluoro athylene, Fluoride and the good oil resistance is spoiled, as for the ratio, for a use of which oil resistance is required, it although limitation is not carried out, a copolymer of ethyl acrylate / butyl acrylata / acrylic acid 2are required is still more preferred. It can also transpose a part of ethyl acrylate to butyl acrylate in preferred to use sarylic soid 2-methoxy ethyl, acrylic soid 2-ethoxyethyl, etc. by which oxygen was to be inferior by introduction of an alkoxy group which has an ether bond in a side chain, when heat esistance is required it is preferred [the ratio] to make it to 40% or less, it is possible to obtain a Silicon content vinyl aystem monomars, such as vinyltriethoxysilane; A maleic anhydride, Monoalkyl lexylmaleimide, ootylmaleimide, dodeoylmaleimide, stearyl maleimide, Maleimide system monomers, preferrad. It is an acrylic polymer which consists of acrylic ester monomar and a mathacrylic-acid sorylate on the other hand in a use as which oil resistance, such as an automotive application, etc. ntroduced into an alkyl group of a side chain. However, since it is in a tandency for heat resistance such as phenylmaleimide and cyclohexylmaleimide; Acrylonitrile, Nitrile group content vinyl system order to improve the low-temperature characteristic etc., without spoiling oil resistance, it is also content vinyl monomers, such as perfluoro propylene and vinylidene fluoride. Vinyltrimetoxysilane, order to raise that low-temperature characteristic, since it tends to be a little inferior to the lows preferred to carry out to 40% or less, and also it is more preferred to make it to 30% or less. In monomers can also be carried out with an acrylic ester (meta) system monomer. When this vinyl monomers, such as a methacrylonitrile; Acrylamide, Amide group content vinyl system monomers, emperature characteristic (cold resistance), although a polymer mainly concerned with this ethyl colymer which changed the ratio and was suitable in consideration of physical properties needed, fienes, such as isoprene; VCM/PVC, a vinylidene chloride, an allyl chloride, allyl alcohol, etc. are propionate, viryl pivalate, benzoic acid vinyl, and viryl cinnamic acid, and propylene, Conjugated nentioned. These may be used independently, and even if it carries out copolymerization of the such as oil resistance, heat resistance, and the low-temperature characteristic, according to a various application or the purposa damended. For example, as an example which is excellent in properties balance, such as oil resistance, heat resistance, the low-temperature characteristic, of fumaric acid; Malcimide, Methylmaleimide, ethylmaleimide, propyl maleimide, butylmalcimide, nonomer from physical properties etc. and (meta) an acrylic soid series monomer of cutput is nethoxy ethyl (it is 40-50/20-30/30-20 at a weight ratio) is mentioned. In this invention, it is these desirable monomers are contained not less than 40% by a weight ratio in these desirable olurality, they are not cared about. Especially, a polymer which consists of a styrene system system monomer is illustrated, styrene, vinyltoluene, alpha-methylstyrene, Styrene system

icrylic ester system copolymer with low (meta) viscosity, and] to use a living-radical-polymerization distribution is narrow, and in order to obtain an acrylic ester system copolymar which has a crosscompound, a peroxide, etc. as a polymerization initiator generally has a value of molecular weight inking functional group in molacular chain terminals at a high rata (meta), it is preferred [it is an especially as a synthetic method of an acrylic ester system copolymer (A6). However, it has the distribution as large as two or more, and viscosity becomes high. Therefore, molecular weight Meta) It is not limited but what is necessary is just to carry out by a publicly known method problem that a polymer obtained by the usual free radical polymerizing method using an azo above-mentioned expressive form.

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IP,4101632,B [DETAILED DESCRIPTION]

above-mentioned "living-radioal-polymerization method" has halogen comparatively advantageous to halide compound An initiator, An "stom-transfer-radiosl-polymerization method" which polymerizes volumes, 5614 pages, etc. will be mentioned as this atom-transfer-radical-polymerization method in an acrylic eater (meta) system monomer by making a transition metal complex into a catalyst, As a manufacturing method of an acrylic ester system copolymer which in addition to the feature of the Also in a "living-radical-polymarization method", an organic halogenated compound or a sulfonyl flexibility of a design of an initiator or a catalyst being large (meta), it is still more desirable. 117 a functional group conversion reaction etc. at the end, and has a specific functional group from

Matylaszewski et al. and journal OBU American chemical society (J. Am.Chem.Soc.) 1995.

As compared with an organic polymar which can improve notably the endurance of this (meta) acrylic oopolymer manufactured using the above "living-radical-polymerization method" and an "atom-transfer-radical-polymerization method", elongation may be insufficient and endurance may be bad. skeletons, such as a polyoxyalkylene series polymer. Even if it uses an acrylic ester (meta) system ester system copolymer by using on silicon a silicon containing functional group which has three or system copolymer which has a reactive silicon group (meta) may have low elongation as compared A hardened material produced by hardening a hardenability constituent containing an acrylic ester with a hardenability constituent containing an organic polymer which has other principal chain mora hydrolytic basas as a raactiva silicon group, and has other principal chain skeletons, an

endurance improvament affect is larga.

process using the free radical polymenzing method for having used a chain transfer agent for JP,H3used an atom-transfer-radical-polymerization method for JP,H9-272714.A etc. is indicated, it is not 14068,B, JP,H4-55444,B, JP,H6-211922,A, etc. is indicated, for example. Although a process which As a process of an acrylic ester system copolymer which has a reactive silicon group (meta), a imited to in particular these. t is a general formula in an acrylic ester system copolymer which has the above-mentioned reactive silicon group (meta) (6). :

accompanying a hydrolysia raaction of a reactive silicon group, and it is a polymer whose stability of a specially (A8) an acrylic ester system copolymer that has a basis expressed with (R4in formula is the same as the above) (meta) can be used as an ingredient. Heat resistance based on an acrylic ester (mata) system copolymer of a principal chain skeleton in this (A8) ingredient, it has the feature which excellent in weatherability and chemical resistance, and thara is no ganaration of methanol nardened material, endurance, and creep rasistance are still batter. - Si(OR*) 3 (6)

component contained in a hardened material formed eventually increases especially when a reactive A reactive silicon group of the aforementioned (A8) ingredient may be in an end or an inside of an organic polymer chain, and may be in both. Since effective network chain density of a polymer silicon group is in an end of a polymer main chain, it is desirable from points, like a rubber-like hardened material of high elongation becomes is easy to be obtained with high intensity.

As a polymerization method of the aforementioned (A8) ingredient, when a living-radical-

rate, it is more desirable and especially an atom—transfer—radical—polymerization method is preferred polymerization method is used, since molecular weight distribution is narrow, it is hypoviscosity, and from the ability to introduce a cross-linking functional group into molecular chain terminals at a high

An scrylic ester system copolymer which has the above-mentioned reactive silicon group (meta) may

be used alone, and may be used together two or more sorts.

together two or more sorts. Specifically, a polyoxyalkylene series polymer which has a reactive silicon An organic polymer which has these reactive silicon groups may be used alons, and may be used

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roup, a saturated hydrocarbon system polymer which has a reactive silicon group, an acrylic ester system copolymer which has a reactive silicon group (meta), and an organic polymer which blends :wo or more sorts chosen from a group, ** and others, can also be used

าละ a reactive ailicon group, and an acrylic ester system copolymer which has a reactive silicon group (meta), Although proposed by JP,59=122541 A, JP,83=112642 A, JP,H6=172631,A, JP,H11=116763,A A manufacturing method of an organic polymar which blends a polyoxyalkylene series polymer which

It is known as compared with a case where a polyoxyalkylene series polymer is independently used

etc. it is not limited to in particular these.

for an organic polymer which blends a polyoxyalkylene series polymer which has this reactive silicon group, and an acrylic ester system copolymer which has a reactive silicon group (meta) that stability is bad. Then, the above-mentioned general formula (6) as a polyoxyalkylene series polymer

component in the aforementioned organic polymer to blend:

- Si(OR*), (6)

A polyoxyallylene series polymer (A5) which has a basis expressed with (R^{4in formula} is the same as has a reactive silicon group (meta) has outstanding atability, enduranca, and creep resistance based the above) is used, An organic polymer blended with an acrylic ester system copolymer (A6) which on the (A5) ingredient, while outstanding waatherability and an adhesive property based on an ingradient (A6) are shown. A6) A desirable example of an acrylic estar (mata) system copolymer of an ingredient has a reactive illicon group, and a chain is a following general formula substantially (14).:

con groups, and a chain is a following general formula substitution
$$\mathbb{R}^4$$

$$-CH_2 - \zeta - \qquad (144)$$

(a hydrogen atom or a methyl group, and R¹¹ show the alkyl group of the carbon numbers 1-8 among he acrylic ester monomer unit which has an alkyl group of the carbon numbers 1-8 expressed with a formula, as for R¹⁰) (mata), and following general formula (15):

Formula 4

(-- inside of formula, and R¹⁰ -- the above -- the same -- R¹² shows a with a carbon numbers of

ten or more alkyl group ---) --- to a copolymer which consists of an acrylic ester monomer unit which has a with a carbon numbers of tan or more exprassed alkyl group (meta-). It is tha method of blanding and manufacturing a polyoxyalkylene series polymer which has a reactive silloon group [0172] nttp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdl.i. 2010/04/30

JP,4101632,B [DETAILED DESCRIPTION]

propyl group, n-butyl group, t-butyl group, a 2-ethylhexyl group, etc. -- desirable --- 1-4 --- an alkyl as R¹¹ of said general formula (14) --- the carbon numbera 1-8 of a methyl group, an ethyl group, a group of 1-2 is raised still more preferably. An alkyl group of R¹¹ may be independent and may be nixed two or more sorts. as ${
m R}^{12}$ of said general formula (15) -- ten or more carbon numbars of a lauryl group, a tridecyl group, a cetyl group, a stearyl group, a behenyl group, etc. -- usually -- 10-30 -- a long-chain alkyl group of 10-20 is raised preferably. Like a case of R¹¹, an alkyl group of R¹² may be independent and may be mixed two or more sorts.

Although a chain of a ** (meta) acrylic ester system copolymer consists of a monomeric unit of a formula (14) and a formula (15) substantially, a "real target" here means that the sum total of a

monomeric unit of a formula (14) which exists in this copolymer, and a formula (15) surpasses 50 % of the weight. The sum total of a monomeric unit of a formula (14) and a formula (15) is 70 % of the weight or more preferably. As for an abundance ratio of a monomeric unit of a formula (14), and a monomeric unit of a formula As monomeric units other than a formula (14) which may be contained in this copolymer, and a (15), 95:5-40:60 are preferred at a weight ratio, and 90:10-60:40 are still more praferred.

cthyl methacrylate, A monomer containing amino groups, such as aminoethyl vinyl other, a monomerio groups, such as glycidyl acrylate and glycidyl methacrylate, Diethylamino ethyl acrylate, diethylamino unit which originates in acrylonitrile, styrene, alpha-methylstyrene, alkyl vinyl ether, VCM/PVC, vinyl formula (15), For example, acrylic acid, such as acrylic acid and methacrylic acid; Acrylamide, Amide groups, such as methacrylamide, N-mathylolacrylamide, and N-methylolmethacrylamide, Epoxy acetate, vinyl propionate, ethylene, etc. in addition to this is raised.

has a reactive silicon group, and an acrylic ester system copolymer which has a reactive silicon group (meta) is proposed by JP,H1-188764A, JP.2000-186176A, ctc., it is not limited to in particular these. Although an organic polymer which blends a saturated hydrocarbon system system polymer which

organio polymer which has a reactive silicon group as a manufacturing method of an organic polymar which blends an acrylic ester system copolymer which has a reactant silicon functional group (meta) A method of polymerizing an aprylic ester (meta) system monomer elsewhere under existence of an can be used. Although this manufacturing mathod is concretely indicated by each gazette, such as JP.59-78223.A. JP.59-188014.A. JP.50-228516.A. and JP.60-228517.A. it is not limited to these. In this invention, silicate cen be used as a (B) ingredient. This silicate has the function to improve the stability of an organic polymer which is the (A) ingredient of this invention, endurance, and oresp

(B) Silicate which is an ingredient is a general formula (16). 0180

resistance.

Si(OR¹³), (16)

(R¹³ are a hydrogen atom or an alkyl group of the carbon numbers 1-20, an aryl group of the carbon numbers 7–20 independently among a formula, respectively.) -- they are tetra alkoxysilane expressed numbers 6-20, and the univalent hydrocarbon group chosen from an arallyl group of the carbon or its partial hydrolysis condensate.

trimethoxysilane, dimethoxy diathoxysilane, methoxy triethoxysilane, Tetra alkoxysilane (tetrasilkyl silicate), such as tetra n-propoxysilane, tetra i-propoxysilane, tetra n-butoxysilane, tetra ioutoxysilane, and tetra t-butoxysilana, and those partial hydrolysis condensates are raised As an example of silicate, for example A tetramethoxy silane, a tetraethoxysilane, Ethoxy

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Since a partial hydrolysis condensate of tetra alkoxysilane has an improvement effect of the stability of this invention, endurance, and creap resistance larger than tetra alkoxysilane, it is preferred.

It is, the when we make to sed and contry out, eaterful (Perdoptic of the water to text allowoyslaten by a continue that as a partial hydrobysis condensate of said texts allowoyslane for example, and was made to condensa is raised A commercial thing can be used for a sensitil hydrobysis condensate of an other condensate is raised A commercial thing can be used for a partial hydrobysis condensate of an and ANAMO gisted compound, As a such a condensate, the methylailests 51, the ethyl allease 40 (all Total (1) shows an improvement effect of still better stability, crodurance, and creep resistance by solicities (14), superiorist (14), of the invention in impedient (14), and the (16) impedient. By combining with an impedient (14) sepecially shows an improvement effect of good stability.

andurance, and creep resistance.

are made in Col Coat), etc. are mentioned, for example.

1918.)

Na amount of ingradient used, 0.1 - 10 weight section is preferred to (A) ingradient 100 weight section, and also 1 - 5 weight section is preferred. (B) Misdaings of an ingradient and less than the rungs, an inprovement effect of stability, endurance, and onesp-resistance may not to enough, and a turn ent en my become slow if leadings of the (B) ingredient exceed this trangs. The above-mentioned

to the intrinsimple, carboxylio acid tin salt can be used as a ((3) ingredient. As compared with other intrinsimple condensation captivists, the statistify of a hardwood material obstance, and care of cases of cases of the salt as a signal condensation castal variety.

alloate may be used only by one kind, and may carry out two or more kind mixing usa.

esistance can be improved by using this carboxylo sold tin salt as a silanol condensation catalyst of a regain polymer which is an ingredient (A1) of this invention. [0187]

Limitation in particular does not have carboxylic acid tin saft (C) used for this invention, and various kinds of compounds can be used for it.

may be especially used suitably from a point of availability.

When it illustrates concretely, acetic acid, propionis axid, betancia axid, a valerio axid, caprote axid, Fauntin axid, axypol, axid, 2 terphranasco axid, basingeria axid, capric axid, fundeamode axid, lauric axid, axid, tribidosid mytelo axid, prentator) axid, behinto axid, heptanological, stavnio axid, lauric axid, tribidosid mytelo axid, prentator) axid, behinto axid, heptanological, stavnio axid, member axid, tribidosid mytelo axid, axid,

and Trazes and primarises (Trazes and American Res American Services and American Research Se

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sold, 2-hydroxytetradecanoic acid, IPURORU acid, 2-hydroxyhexadecanoic acid, YARAPI Norian acid, uni∹PERIN acid, AMBURETTORU acid, ARYURITTO acid, 2-hydroxyoctadecanoic acid, 12−

as gorlio acid; Acetoacatic acid, ethoxyacetic acid, Glyoxylle acid, glycolic acid, gluconic acid, sabinic

Negrospostakeanow and 18 hydroxyactedenosis and 19 hydroxyactedenosis and 18 hydroxyacted 18 hydroxyac

(U194) (U

when the melting point of said carboxylo look of high (roysalinink is high), the melting point becomes high in a seiling memory and it is hard to deal with authoxylo sold to said which has the add radioal (worthalithy— heal). Therefore, as for the melting point for said entowals acid, it is preferred that it is 65 % or of leas, it is more performed that it is -65-50 **, and it is preferred that it is a specially -40-35.

when a carbon number of said carboxoyic acid is large, to molecular weight is large), it becomes when a carbon number of said carboxoyic acid is large. The third is the said is said to the said of the said of the said is the carbon that the whole which is not of oreal if it founds weight is easily to said the oreal said in the carbon weight is easily to carbon addition of a said to said the throughout weight is easily to carbon addition of the said to the said that the said to the

UN 93). It is preferred that it is the rin salt of a point of the ease (workability, viscosity) of dealing with it of enchoosies and in a salt to disoavolie and or monocarboxylic acid, and it is more preferred that it is then it as it of monocarboxylic acid.

[0194] As said monocarboxylic acid tin salt, it is a general formula (17). :

Sn(OCOR) 2 (17)

(it is the same as the above the inside R of a formula.) Two ROOO-bases may be the same and may differ. A betravalent Sin compound expressed is preferred. A divisient Sin compound expressed with a direct of the compound expressed with a seriest formed formula (17) from a point of hardenability and availability is more preferred. [0195]

carboxyle and the sail (nee descared seed the) In which said outboxyle and in sail (1) is carboxyle and the sail of surplications on all the but and the the source who can so not not an all the position of a advoxyl frough it the 2nd class canton Pradiciouid time that more preferred from a cure note bing quick of and especially convolved each office such control and control and office as carboxyl group in the despecially convolved and the sail whose carbox committed adjoints a carboxyl group is the 4th class as the lost is preferred.

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(C1) As carboxylic soid tin salt of an ingredient, it is a general formula (19). : [0188] | Formula 5]

[0197]

Formula 5] $\begin{bmatrix}
Formula 5] \\
Fo$

[0199] (among the formula, \mathbb{R}^{14} \mathbb{R}^{15} and \mathbb{R}^{19} are the independent substitution or unsubstituted univalent organic groups, respectively, and may contain the carboxy group.) — the chain fatty and this accessed or general formula (20).

expressed or gene [0200]

Formula 6]
R¹⁷
R (2 C

(10201)

(Among the formula, a subaritution or unsubstituted univalent organic group and R¹⁸ are substitution
(Among the formula, a subaritution or unsubstitution or unsubstitution divalent organic groups, and R¹⁷ may contain the carbox/i group, respectively.) it

esches and is a general formula (21). : [0202] $\begin{pmatrix}
R^{19} & & & & \\
R^{19} & & & & \\
& & & & \\
\end{pmatrix} = C - C - C - S n \quad (2.1)$

[0003]

[0003]

[0004] American American Ris is a substitution or unsubstituted trivolent cripario group, and may contain a categories activity and may solve the substitution of substitution

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Child Dimetalyshuschin cask day for mythoration and death-fundation and 2-denterably amon and Child death-fundation day of the child destroyorie and cut and 22-denterably amon and 2-denterably distrate and Child minimized production is a "methylic best and 4-denterably amont in a "methylic production of the 3-denterably amont in 22-denterably amont in 23-denterably amont in 24-denterably amont in 25-denterably amont comparing auch a structure to a state of the amont in 24-denterably amont comparing auch a structure to

From a point that compatibility with an ingredient and workability are expecially (A1) good the monocarbooylate is more preferred and also chain the monocarbooylate is more preferred Since acquisition is asso, public and the acquisition of the acquisition of the acquisition and acquisition and the acquisition and the acquisition and acquisition acquisition and acquisition and acquisition and acquisition acquisition acquisition and acquisition a (C1) Also is an improdient, although endowglate of divalent tim and carboxylate of tetravalent to are constrined like a sease of the above-mentioned (O) ingredient, carboxylate of a point of hardenshiply and swallability to divalent tin it more preferred.

As for a carbon number of ourboxile soil which has an soil refeal of an ingredient (C). It is a removed that the carbon for th

As an improdent from these points (CI) Not decembe and thir (devalent), BASA to acid the (devalent), 2.2-dimethyloctaniole acid thir (devalent), 2-ethyl-25-dimethyllineans acid thir (devalent), Neo decanoic and in therealensole BSAS to acid the (devalenton), 2-charityloctanion acid thir (devalent), Neo decanoic and especially 2-cthyl-25-dimethyllineans acid thir (deravolence) are preferred.

(C) As amount of an intradient and (CI) ingradent used, about 0.01–20 weight sections are preferred or prepared (A) (1) or delification and also about 0.01 or weight sections are preferred Since a cure rate may become also and a hardening reaction will become fully difficult to advance if bacinging cure rate may become also and a hardening reaction will become fully difficult to advance if bacinging are also than this rate it is not delighte. On the other than, if indeging exceed that many, working lift becomes about too much, and workability may versee, and it is not desirable from a point of

() () () Ingrediant and (C1) an ingredient can be used combining two or more sorts besides using it

storage stability.

On the other hand, only of the (O) impredient and (Of) an impredient, activity is low, and when resident and the content bardenable is not accurated, an amine compound can be added as a co-catalysti. [021] when the compounds, although indicated to USHE-251(91) for example. Specifically leferably activities of the compounds, although indicated to USHE-251(91) for example. Specifically leferably interior properties of the compounds of the composition of composition of the composition o

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sniline, stearylaniline, a triphenylamina, N.N-dimethylanilina, dimethylbenzyl aniline, etc. reach, As

other amines, monoathanolamine, diethanolamine, Triethanolamine, dimethylamino ethanol

rropylamine, xylylene diamine, ethylanadiamine, Hexamethylenediamine, dodecamethylenediamine, jiethylenetriamine, Triethylanetetramine, tetraethylanepentamine, benzylamine, Diethylamine

limethylethylenediamine, Triethylenediamine, guanidine, diphenylguanidine, N,N,N', and N'-tetramethyl (3-butanediamine, NNN, N-tetramethyl ethylene diamine, 2.4.8-tris(dimethyl aminomethyl) phenol, Although morpholine, N-methylmorpholine, 2-ethyl-4-methylimidazole, 1, and 8-diazabicyclo (5, 4, 0) undecene 7 (DBU) etc. are mentioned, it is not limited to these.

As for loadings of said amine compound, about 0.01-20 weight sections are preferred to organic polymer 100 weight section of an ingredient (A1), and also its 0.1 to 5 weight section is more

osdings of an amine compound exceed 20 weight sections, pot life may become short too much and veight sections, and a hardening reaction becomes fully difficult to advance. On the other hand, if preferred. A cure rate may become it slow that loadings of an amine compound are less than 0.01 not preferred from a point of workability.

catalyst is used as a silanol condensation catalyst of an organic polymer which has a reactive silicon group, as compared with other silanol condensation catalysts, a hardenability constituent with high catalytic activity, and good depths hardanability and an adhesive property is obtained. However, n this invention, an organic tin catalyst can be used as a (D) ingredient When this organic tin according to an addition of this organic tin catalyst, the stability of a hardened material of a nardenability constituent obtained, endurance, and creep resistance fall.

activity is high, and depths hardenability and an adhesive property are good, and the stability of a A hardenability constituent which added an organic tin catalyst of the (D) ingradient by using an organic polymer which is an ingredient (A1) of this invention as a polymar component, Catalytic nardened material obtained, endurance, and creep resistance can be maintained highly.

portion, and may remain on conditions of heat and high humidity especially with un-hardening. On the combined, the hardenability of a thin layar part can be improved notably, maintaining the stability of a n using adhesives or a sealing material which, on the other hand, contains an organic polymer which other hand, if said organic tin catalyst (D) is used as a curing catalyst, as mentioned above, stability batalyst of an organic polymer and the (D) ingredient which is an ingradient (A1) of this invention is nasonry joint and a sealing material will remain by a thin layer, it is hard to harden that thin layer nowever, if this carboxylic acid tin salt is used as a curing catalyst, when it will be slike around a carboxylic acid tin salt of the aforcmentioned (C) ingredient as a curing catalyst in many cases. and endurance will fall, but the hardenability of a thin layer part is good. Then, if an organic tin has a reactive silicon group as the main ingredients for a use which needs endurance, it uses nardaned material obtained, and endurance highly. [0216]

depending on an addition of an organio tin catalyst of the (D) ingredient, stability and andurance may fall a little. Then, it is more preferred to decrease the quantity of an addition of the (D) ingredient to Howaver, aven if it combines with an organic polymer which is an ingredient (A1) of this invention, hardenability, depths hardenability, an adhesive property, and thin layer hardenability are acquired such an extent that carboxylic acid tin salt of the (C) ingredient is used together and sufficient

As an example of said organic tin catalyst (D), they are dialkyl tin carboxylate, dialkyl tin oxide, and a with an organic tin catalyst of the (D) ingredient as a curing catalyst.

Sn(OZ) 4-g or [Q2Sn(OZ)] 20 (22) general formula (22).

expresses among a formula an organic group which has a functional group with which Q can form a coordinate bond in an inside of a univalent hydrocarbon group of the carbon numbers 1-20, or self for liphenyldimethoxysilane, and phanyltrimethoxysilane. Since activity as a silanol condansation catalyst a univalent hydrocarbon group of the carbon numbers 1-20 to Sn) g is 0,1, 2, or 3. A compound etc. which are shown are shown. Tetravelent tin compounds, auch as dialkyl tin oxide and dialkyl tin discetate, it is usable as a (D) ingredient also in a reactant with a low molecule silicon compound which has hydrolytic silicon groups, such as a tetraathoxysilane, methyl triethoxyailane,

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is high, chelate compound and tin alcoholates, auch as a compound shown by a general formula (22) also in these, i.e., dibutyl tin bisacetylacetonate etc., are more prafarrad.

tin dibenzyl malate, dibutyltin maleate, dioctyl tin diacetate, dioctyl tin distearate, dioctyl tin dilaurate, As an example of said dialkyl tin carboxylate, For example, dibutyltin dilaurate. dibutyltin discotate, i dibutyl tin diethylhexano rate, Dibutyl tin JIOKUTETO, dibutyl tin dimethylmslate, dibutyl tin diethyl malate, Dibutyl tin dibutyl maleate, dibutyl tin diisoootyl malate, Dibutyl tin ditridecyl malete, dibutyl dioctyl tin diethyl malate, dioctyl tin diisooctyl malate, etc. are mentioned As an example of said dialkyl tin oxide, dibutyl tin oxide, dioctyl tin oxide, a mixture of dibutyl tin oxide and phthalic ester, etc. are mentioned.

if said chelate compound is illustrated concretely,

Formula 8

Although ** is mentioned, it is not limited to these. In these, its catalytic activity is high, and it is low cost, and since dibutyl tin bisacetylacetonate is easy to receive, it is the most preferred.

said tin alcoholates are illustrated concretely,

Formula 9

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(C4H₉) ₂Sn (0CH₃) ₂

C4H9Sn (0CH3) 3

Sn (0CH₃) 4

(C₄H₉) ₂Sn (OC₃H₇) ₂

(C4H₉) 2Sn (0C4H₉) 2

(C₄H₉) ₂Sn (0C₈H₁₇) ₂

(C4H₉) ₂Sn (0C₁₂H₂₅) ₂

(C₈H₁₇) ₂Sn (0CH₃) ₂

 (C_4H_9) $_2Sn$ $(0 \langle \bigcirc \rangle)_2$

(C4Hg) 2Sn (0 (1) 2

 $(C_4H_9)_2Sn(0(1))_2$

[(C4H9)28n]20 CH3

[(C4H₉) 2Şn] 20

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JP,4101632,B [DETAILED DESCRIPTION]

Although ** is mentioned, it is not limited to these. In these, a dialkyl tin JIARUKOKI side is preferred. Especially the dibuts/i tin JIMETOKI side is low cost, and since it is easy to receive, it is

(D) As amount of ingredient used, about 0.01-20 weight sections are preferred to ingredient (A1) 100 range, it is not desirable. On the other hand, if loadings exceed this range, working life becomes short weight section, and also about 0.1-10 weight sections are preferred. Since a cure rate may become slow and a hardening reaction will become fully difficult to advance if loadings are less than this too much, and workability may worsen, and it is not desirable from a point of storage stability.

exceed this range, working life becomes short too much and workability may worsen. (D) The stability When loadings of an ingredient are less than this range, a cure rate may become slow, when loadings ngredient 0.01 - 10 weight section to ingredient 100 weight section, and also it is more preferred to of a hardened material which will be obtained if an inprovement effect of hardenability, depths hardenability, an adhesive property, and thin layer hardenability may not be enough if loadings of an ngredient are less than this range, and loadings exceed this range, endurance, and creep resistance As amount of [in case used of using the (D) ingredient and the (C) ingredient together as a curing catalyst], (A1) It is preferred to consider it as (C) ingredient 0.5 - 20 weight section and (D) consider it as (C) ingredient 1 - 10 weight section and (D) ingredient 0.02 - 5 weight section. (C)

he (D) ingredient can be used combining two or more sorts besides using it slone.

condensation catalyst of an organic polymer which is an ingredient (A1) of this invention. A non-tin In this invention, a non-tin oatalyst can be used as a (E) ingredient. This non-tin catalyst has a function which improves the stability of a hardened material obtained, endurance, and creep resistance as compared with other silanol condensation catalysts, when it uses as a silanol

ostalyst which is the (E) ingredient is an eco-friendly curing catalyst with high social needs.

As a non-tin catalyst which is the (E) ingredient which can be used for this invention, although there is no restriction in particular, an organic metallic compound containing carboxylic soid, carboxylic acid metal salt other than carboxylic acid tin salt, organic sulfonic acid, alkyl acid phosphate and 3B

The various above-mentionsd asrboxylic acid which has an aold radioal of carboxylic acid tin salt: which is the (G) ingradient as carboxylic acid can be illustrated.

fellows, and 4A group metal, etc. are illustrated.

As for said carboxylic acid, it is preferred like carboxylic acid tin salt (C) that carbon numbers

that it is especially 8-12. A point to dicarboxylic acid or monocarboxylic acid of the ease (workability, viscosity) of dealing with it of carboxylic scid is preferred, and monocarboxylic acid is more preferred noluding carbon of a carbonyl group are 2-20, it is more preferred that it is 6-17, and it is preferred sarboxylic acid (neo decanoic acid.) in which said carboxylic acid is carboxylic acid (2-ethylhexanoic soid etc.) and the 4th class carbon whose carbon of an alpha position of a carboxyl group is the 3rd plass carbon A pivalic soid etc. are more preferred from a cure rate being quick, and especially carboxylic acid whose carbon atom which adjoins a carbonyl group is the 4th class carbon is Especially as carboxylic acid, 2-ethylhoxanoic acid, noo decanoic acid, BASA tic acid, 2,2-dimethylootanoic acid, and 2-ethyl-2,5-dimethylhoxane acid are preferred from a point of availability,

As carboxylic soid metal salt other than said carboxylic soid tin salt, metal salt of the various above-

mentioned carboxylic acid can be used conveniently.

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carboxylic acid cobalt, a carboxylic acid zirconium, and carboxylic acid cerium, From a high point, the carboxylic acid titanium, and a carboxylic acid zirconium are still more preferred, and carboxylic acid Darboxylio acid potassium, carboxylio acid barium, carboxylio acid manganese, carboxylic acid nickel, sotivity of a catalyst is preferred and Carboxylic acid bismuth, carboxylic soid calcium, Carboxylic soid vanadium, carboxylic acid iron, carboxylic acid titanium, carboxylic acid potassium, Carboxylic Sarboxylic acid calcium, carboxylic acid vanadium, carboxylic acid iron, carboxylic acid titanium, Carboxylic acid bismuth, carboxylic acid calcium, carboxylic acid vanadium, carboxyllo acid iron, oismuth, carboxylic acid iron, and carboxylic acid titanium are especially the most preferred. soid barium, carboxylio sold manganese, and a carboxylic sold zirconium are more preferred,

nstorial and weatherability which are obtained are high, and carboxylic sold bismuth, carboxylic acid calcium, carboxylic sold titanium, carboxylic acid tranium, carboxylic acid barium, and a carboxylic carboxylic acid potassium, carboxylic acid barium, carboxylic acid manganese, carboxylic acid nickel, Darboxylic acid bismuth, carboxylic acid calcium, carboxylic acid vanadium, Carboxylic acid titanium, coloring of a hardenability constituent obtained, and a point that the heat resistance of a hardened carboxylic soid cobalt, and a carboxylic acid zirconium, it is more desirable from a point with little acid zirconium are still more preferred. [0237]

t is more preferred that it is metal salt of a point of the casa (workability, viscosity) of dealing with it of carboxylic acid metal salt to monocarboxylic acid.

As said monocarboxylic acid metal salt, it is general formula (23) - (35). :

3(OCOR) 2 (23)

3a(OCOR) 2 (24)

Fe(OCOR) 2 (26) /(OCOR) 3 (25)

Fe(OCOR) 3 (27)

Ba(OCOR) 2 (30) T(OCOR) (28) K(0COR) (29)

An(OCOR) 2 (31)

ickel(OCOR) 2 (32) Co(OCOR) 2 (33)

2r (0) (0COR) , (34) 3e(DCOR) 3 (35)

The inside R of a formula is substitution or an unsubstituted hydrocarbon group, and may include a carbon carbon double bond.) Two ROOO-bases may be the same and may differ. Garboxylic acid netal salt expressed is preferred.

As a carboxylic acid group of carboxylic acid metal sait other than said carboxylic acid tin salt, an acid radical of various carboxylic acid tin salt ilkustrated as the aforementioned (C) ingredient can be 0239

ethylhaxanoic acid vanadium (trivalent), 2-ethylhexanoic acid calcium (divalent), 2-ethylhexanoic acid From a viewpoint of the availability of a raw material, and compatibility, as an example of desirable oarboxylic acid metal salt, 2-ethylhoxancic acid bismuth (trivalent). 2-ethylhexancic acid iron (divalent), 2-ethylhexancic acid iron (trivalent), 2-othylhexancic acid titanium (tetravalence). 2old bismuth (trivalent), Neo decenoic acid iron (divalent), neo decenoic acid iron (trivalent), neo potassium (univalent), 2-athylhoxanoio acid barium (divalent), 2-ethylhexanoio acid manganose

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(tetravalence), Naphthenic acid vanadium (trivalent), calcium naphthenate (divalent), naphthenic acid potassium (univalent), Naphthenic acid barium (divalent), manganesc naphthenate (divalent), parium (divalent), Manganase oleate (divalent), oleio acid nickel (divalent), oleic acid cobalt (divalent). trivalent), oleic acid iron (divalent), oleic acid iron (trivalent), oleic acid titanium (tetravalence), olei An olete acid zirooniumi (tetravalence), olete acid cerium (trivalent), naphthenic acid bismuth (trivalent), Naphthenic acid iron (divalent), naphthenic acid iron (trivalent), naphthenic acid tranium oalcium (divalent). Neo decanoic acid potassium (univalent), neo decanoic acid barium (divalent), a acid vanadium (trivalent), Oleic acid calcium (divalent), oleic acid potassium (univalent), oleic acid neo decanoio acid ziroonium (tetravalence), Neo decanoio acid cerium (trivalant), biamuth oleate decanoic sold titanium (tetravalence), Neo decanolc sold vanadium (trivalent), neo dacanoic sold naphthonio acid nickel (divalent), ochait naphthenate (divalent), a naphthonio acid zirconium (tetravalence), naphthenio acid cerium (trivalent), ctc. are mentioned

Z-ethylheamole acid bismuth (trivalent) from a viewpoint of catalytic activity, Z-ethylheamole acid iron (diselact). Z-ethylheamole acid from (trivalent), Z-ethylheamole acid trium (tetravelence), Neo decanole acid bizmuth (trivalent), neo decanole acid from (divolent), no decanole acid from (trivalent) the decanole acid bizmuth (trivalent), acid muth other (trivalent), other acid from (divolent). Neo decanole acid framinin (tetravelence), bizmuth others (trivalent), other acid from (divolent). acid fron (trivalent), oleic acid titanlum (tetravalence), naphthenic acid bismuth (trivalent), Naphthenic acid from (drivalent), naphthenic acid iron (trivalent), and naphthenic acid titanium (tatravalence) are more preferred, and Z-ethylhaxanojo acid iron (trivalent), neo dacanojo acid iron (trivalent), and asspecially naphthenio acid iron (trivalent) and preferred.

(tetravalence), 2-ethylhexanolo soid calcium (divalent), 2-ethylhexanolo acid potassium (univalent), 2acid zirconium (tetravalence). Naphthenic acid bismuth (trivalent), naphthenic acid titanium (tetravalence), calcium naphthenate (divalent), naphthenic acid potassium (univalent), naphthenic acid 2-ethylhaxanoic acid bismuth (trivalent) from a viewpoint of coloring, 2-ethylhexanoic acid titanium (divalent), neo desanoic acid potassium (univalent), Neo decanoic acid barium (divalent), a neo decanoic acid zirconium (tetravalence). Bismuth oleate (trivalent), oleic acid titanium (tetravalence) oleic acid calcium (divalent), Oleic acid potassium (univalent), oleic acid barium (divalent), an olcic ethylhexanoic acid barium (divalent), 2-ethylhexanoic acid zirconium (tetravalence), Neo decanoic acid bismuth (trivalent), neo decanoic acid titanium (tetravalence), Neo decanoic acid calcium parium (divalent), and a naphthenic acid zirconium (tetravalence) are more preferred

foluenesulfonic acid, styrene sulfonic acid, etc, are raised as organic sulfonic acid.

Alkyl acid phosphate is -O-P (=0) OH. It is phosphorio aster containing a portion and alkyl acid phosphate as shown below is contained. An organic acid nature phosphoric ester compound is preferred in respect of compatibility and curing catalyst activity. An organic acid nature phosphoric aster compound is expressad with (R^{20.-0)} h^{--P(=0)} (-OH) _{3-h} (in the inside h of a formula, 1 or 2, and R²⁰ show an organic residue).

(CH₃O) ₂-P (=O) (-OH) and (OH₃O)-P(=O) (-OH) ₂, (C₂H₃O) ₂-P (=O) (-OH) and (C₂H₃O)-P(=O) (-Below, it illustrates concretely.

0246

and ((CH2OH) (CHOH) C2H4OJ-P(=0) (-OH) 2 ctc. are raised, it is not limited to the above-mantioned 0H) 2, (G_3H_7O) 2-P (=0) (-OH) and (G_3H_7O) -P(=O) (-OH) 2, (G_4H_9O) 2-P (=O) (-OH) and (G_4H_9O) -P $(=0) \ (-0H) \ ((GH_2OH) \ (CHOH) \ O_1 - P(=0) \ (-OH) \ _2. \ Although \ ((GH_2OH) \ (CHOH) \ C_2H_4O) \ _2 - P \ (=O) \ (-OH) \ (-OH) \ ((GHOH) \ C_2H_4O) \ _2 - P \ (=OH) \ (-OH) \ ((GHOH) \ C_2H_4O) \ _2 - P \ (=OH) \ ((GHOH) \ C_2H_4O) \ _2 - P \ (=OH) \ ((GHOH) \ C_2H_4O) \ _2 - P \ (=OH) \ ((GHOH) \ C_2H_4O) \ _2 - P \ (=OH) \ ((GHOH) \ C_2H_4O) \ _2 - P \ (=OH) \ ((GHOH) \ C_2H_4O) \ _2 - P \ (=OH) \ _2 - P \ _2 - P \ (=OH) \ _2 - P \ _2 - P$ (=0) (-0H) $_2$, (C₈H₁₇O) $_2$ -P (=0) (-0H) and (C₈H₁₇O)-P(=0) (-0H) $_2$, (C₁₀H₂₁O) $_2$ -P (=0) (-0H) and (C₁₀H₂₁O)-P(=O) (-OH) 2. (C₁₃H₂₇O) 2-P (=O) (-OH) and (C₁₃H₂₇O)-P(=O) (-OH) 2. (C₁₆H₃₃O) 2-P (=0) (-OH) and (G $_{16}$ H $_{33}$ O)-P(=0) (-OH) $_2$ and $_{040}$ -G $_6$ H $_{12}$ O)2-P (=0) (-OH) and (HO-G $_6$ H $_{12}$ O)-P(=0) (-0H) 2, (HO-C₈H₁₆O)-P (=O) (-OH) and (HO-C₈H₁₆O)-P(=O) (-OH) 2, ((CH₂OH) (OHOH) O] 2-P Ilustration substance. ntp://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/04/30

and alkyl aoid phosphate, activity is low, and when moderate hardenability is not acquired, an amine compound can be added as a co-catalyst. As various smine compounds, the indicated various above—mentioned amine compounds can be used, as a co-catalyst of carboxylio soid tin salt (O).
[Q243]

padings of an amine compound exceed 20 weight sections, pot life may become short too much and preferred. A cure rate may become it slow that loadings of an amine compound are less than 0.01 weight sections, and a hardening reaction becomes fully difficult to advance. On the other hand, if As for loadings of said amine compound, about 0.01-20 weight sections are preferred to organic polymer 100 weight section of an ingredient (A1), and also its 0.1 to 5 weight section is more s not preferred from a point of workability. is a metal system compound of non-tin, besides carboxylic acid metal salt other than said carboxylic oid tin salt. An organic metallic compound containing 3B fellows and 4A group metal is raised, and

compound, an organic boron compound, etc. are preferred from a point of activity, it is not limited to though a titanate organic compound, an organoaluminium compound, an organic ziroonium

cetra (2-ethylhexyl titanate), Chalate compound, auch as titanium chelate, such as titanium alkoxides, As said titanate organio compound, tetraisopropyl titanate, Tetrabuthyl titanate, tetramethyl titanate,

such as triethanolamine titanate, titanium tetra acetylacetonato, titanium ethylacetoacetate, octylene As said organoaluminium compound, aluminum isopropylate, Aluminum alkoxides, such as mono secglycolate, and titanium lactate, etc. are raised.

outoxy aluminum disopropylate and aluminum sec-butyrate. Aluminum chelate, such as aluminum tris scetylacetonato, aluminumtrisethylacetoacetate, and diisopropoxy aluminum ethylacetoacetate, is

As said zirconium compound, zirconium tetra isopropanal POKISAIDO, Zirconium alkoxides, such as a zirconium tetra-n PUROPI rate and zirconium normal butyrate. Zirconium chelate, such as zirconium tetra acetylacetonato, zirconium monoacetyl acetonate, zirconium bisacetylacetonate, zirconium scatylacetonate bis-ethylacetoacetate, and zirconium acetata, is raised.

organoaluminium compound, an organic zirconium compound, an organic boron compound, etc., It is Although **** concomitant use is also possible so, these titanata organic compounds, an

concomitant use with said amine compound or an alkyl-acid-phosphete compound since it is possible to improve activity, and more desirable in a viewpoint of adjustment of working life in hardenability desirabla in a viewpoint which can reduce the amount of catalyst used sapacially according to and ordinary temperature in an elevated temperature. [0255]

range, it is not desirable. On the other hand, if loadings exceed this range, working life becomes short E) As amount of ingredient used, about 0,01-20 weight sections are preferred to ingredient (A1) 100 weight section, and also about 0.5-10 weight sections are preferred. Since a cure rate may become slow and a hardening reaction will become fully difficult to advance if loadings are less than this go much, and workability may worsen, and it is not desirable from a point of storage stability.

The (E) ingredient can be used combining two or more sorts besides using it alone.

In this invention, a minute hollow body can be used as a (F) ingredient. While improving the workability (********, thixotropy) of a constituent notably as indicated to JP,H11-35923.A or JP,H11-310772,A f this minute hollow body is used, it is known that a weight saving of a constituent and low-costzing are possible. Howavar, it is known that the stability of a hardaned material of a hardenability

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constituent and andurance which are obtained will fall according to an addition of this minute hollow

he hardenability constituent which added a minute hollow body of the (F) ingredient by using an

a very small hollow body (henceforth a balloon) which is the (F) ingredient of this invention is a hollow body by which a diameter was preferably constituted from material of minerals of 500 micrometers or organio polymer which Is an ingredient (A1) of this invention as a polymer component can maintain righly the stability of a hardanad material and enduranca which ara obtainad, improving workability

functional filler" (CMC). (F) An ingredient in particular is not limited but it is [ingredient] usable in less or quality of organicity 1 mm or less as indicated, for example on "state-of-the-art art of a various kinds of publicly known balloons.

average particle density exceeds this range on the other hand, a workability improvemant effect may preferred that it is 0.03-0.7g/cm³, and it is preferred that it is especially 0.1-0.5g/cm³. If tensile strength of a hardened material may fall if avorage particle density is less than this range, and As for average particle density of a balloon, it is preferred that it is 0.01-1.0g/cm³, it is more not be enough. An inorganic system balloon is more preferred than a point of stability and endurance to an organic aystam balloon.

As said inorganic system balloon, can illustrate a silicic acid system balloon and a non-silicic acid

ZIRCONIUM SPHEES made from ZIRCOA, KUREKASU fair made from Kureha Chemicals and product etc. on a non-silicic acid system balloon. As an example of these inorganic system balloons, as a milt balloon, a win fight by JJIOHI Chemicals, As a SANKI light by Sanki Engineering Co., Ltd., and glass balloon, a win fight by JJIOHO Short Class Co., Ltd., The Saumicano 3M cell actu-Z23 MICHO SALLOON made from ENERSONGCURING, CELAMIC GLASSMODLIES made from FITSBUNGCORPHING, AC GLASS BUBBLES made from 3M, TAUBIS Han made from FILES BUBBLES made from 3M, TAUBIS Han made from FILES BUBBLES made from 5M, TAUBIS Han Chemicals, FILLTE U.S.A. As an elumina balloon, as BW by Showa Denko K.K., and a zirconia balloon HOLLOW Chemicals, and fly ash balloons, CEROSPHERES made from PFAMARKETING. FILLITE made from system balloot, and on a silicic acid system balloon. A milt balloon, perlite, glass balloons, a silica balloon, fly ash balloons, etc. can illustrate an alumina balloon, a zirconia balloon, a carbon balloon, and a silica balloon, as Q-CEL by Asahi Glass Co., Ltd., SAIRISHIA made from Fuji SHIRISHIA car boss fair made from GENERAL TECHNOLOGIES are marketed as a carbon balloon.

nere is made to foam, after blending a thing containing a foaming agent, and is good also as a balloor system balloon, On a thermosetting balloon, a phanol balloon, an epoxy balloon, and a urea balloon oan illustrate a saran balloon, a polystyrene balloon, a polymethaorylate balloon, a polyvinyl alcohol balloon, and a styrene acrylic balloon at a thermoplastic balloon. A balloon of thermoplastics which A balloon of thermosatting rasin and a balloon of thermoplastics can be illustrated as said organic constructed the bridge can also be used. A balloon after foaming may be sufficient, and a balloon

EMERSON&CUMING, As a urea balloon, ECCOSPHERES VF-O made from EMERSON&CUMING, As a saran balloon, SARAN MICROSPHERES made from DOW CHEMICAL, Expancel made from Japanese Filament, the Matsumoto Yushi-Selyaku Matsumoto microsphere. As a polystyrene balloon, DYLITE EXPANDABLE POLYSTYRENE made from ARCO POLYMERS, SX863 by Japan Synthetic Rubber As an example of these organic system balloons, as a phenol balloon, Union Carbide UCAR and PHENOLIC MICROBALLOONS, As an opoxy balloon, ECCOSPHERES made from

The above-mantioned balloon may be used alone, and two or more kinds may be mixed and it may be used. The surface of these balloons Fatty acid, fatty acid ester, rosin. What was processed in order

Co., Ltd. (P) are marketed by EXPANDABLE POLYSTYRENE BEADS made from BASF WYANDOTE.

and constructed type atyrene acrylic acid balloon of a bridge.

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tiffening a compound, these balloons ere used in order to oarry out a weight saving and to cut down gent, titanium coupling agent, sluminum cup ring agent, a polypropylene glycol, etc. can be used. o improve dispersibility and the workability of a compound by rosin soid lignin, a silane coupling Without spoiling pliebility, and elongation and intensity among physical properties at the time of

As for the amount of balloon used, about 0.1-50 weight sections are preferred to ingredient (A1) 100 mprovement effect may not be enough if loadings are less than this range, and loadings exceed this weight section, and also its about 0.5-30 weight sections are preferred. When a workability

ange, tensile strength of a hardened material may fall or stability and endurance may worsen.

At this invention, it is a general formula as a (G) ingredient (7). - SiR5

ndopendently, respectively, and c shows 0, 1, or 2,) — an aminosilane coupling agent which has a aasis expressed can be used. General formula (6) which is the (A4) ingredient of this invention about ic R⁵ is an organic group of monovalence of the carbon numbers 1-20 independently among a formula, respectively, 3-c R⁶ is an organic group of monovalence of the carbon numbers 2-20 (OR[®]) 3... (7)

his (G) ingredient:

ave a methoxy group as an alkoxy group combined with a silicon atom, a reactant high methoxy silyl ums into a hardenability constituent with little change of a cure rate. A reactive silicon group of this moup does not generate to a reactive silicon group of the (A4) ingredient. Therefore, a hardenability which has a basis expressed with (R^{4In} formula is the same as the above), it becomes a hardenebility While having stability, endurancs, and creep resistance outstanding by adding to an organic polymer constituent in which an outstanding adhesive property is shown. To a reactive silicon group of this (Q) ingredient. Even if an exter exchange reaction between reactive silicon groups of the (G) ingredient and the (A4) ingredient advances after mixing with the (A4) ingredient since it does not constituent containing the (G) ingredient and the (A4) ingredient is before and after storage, and

silicon atom is 2 to 20, toxic high methanol is not contained in alcohol generated in connection with a G) ingredient and the (A4) ingredient, Since a carbon number of an alkoxy group combined with a ydrolysis reaction of a reactive silicon group when a hardenability constituent carries out condensation hardening, but becomes it with a constituent with high safety.

constituent, when it is considered as I liquid type, since said hardenability constituent which consists of an ingredient and s (A4) ingredient has a large effect which makes small especially change of e Although it is usable as a many liquid [such as 1 liquid type and a two-component type,] type cure rate in storage order, it is preferred.

(7), and an amino group. As an example of a reactive sileong group expressed with a general formula (7), a triethow siskly group, a methyle farboy sibly group, a dimethylethoxy sibly group, an ethylethoxy sibly group, a priceonopoxy sibly group, a methyleth isopropoxy ally group, etc. can be methored. An (G) An ingredient is a compound which has a reactive silicon group expressed with a general formula alkoxy group combined with a silicon atom of a reactive silicon group has preferred toxic ethoxy silyl connection with a hydrolysis reaction and a viewpoint of a cure rate to a triethoxy silyl group is the number of an alkoxy group combined with one silicon atom of a reactive silicon group, two or more pieces are preferred, and its three pieces are more preferred. The toxicity of sloohol generated in reaction, and its ethoxy sllyl group is more preferred. From a viewpoint of a cure rate, as for the group from a viewpoint or isopropoxy silyl of alcohol generated in connection with a hydrolysis most preferred.

triisopropoxy silane, gamms-sminopropyl methyldiethoxysilane, gamms-(2-aminoethyl) aminopropyl riethoxysilane, gamms=(2-aminoethyl) aminopropyl triisopropoxy silane, gamms=(2-sminoethyl) iminopropyl methyldiethoxysilane, gamma-ureido propyl triethoxysilane, gamma-ureido propyl As en example of en ingredient, (G) gamma-aminopropyl triethoxyslane, gamma-eminopropyl

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gsmma-[2-(2-aminoethyl) aminoethylj aminopropyl triethoxysilane, oan be mentioned. A denatured derivative and a condensstion reaction thing of the above-mentioned silane compound can elso use triethoxysilene, N-vinylbenzyl gamma-aminopropyl triethoxysilsne, N.N-bis/gamms-triethoxy silyl propyl)ethylenedismine. Amino group content Silang, such as bis(triethoxy silyl propyl)amine end triisopropoxy silane, gamma-ureido propylmethyl diethoxysilans, N-phenyl-gamma-aminopropyl riethoxysilene, N-benzyl-gamms-sminopropyl triethoxysilene, N-n-butyl-gamma-aminopropyl the above-mentioned silane compound as a (G) ingredient. The (G) ingredient used for this invention is used in 0.1-10 copies to 100 copies of organic polymers

of the (A4) ingredient. It is preferred to use it in 1-5 copies especially. The above-mentioned (G) ngredient may be used only by one kind, and may carry out two or more kind mixing use.

compound which has alloxy silvl groups and does not contain an artino group as a dehydrator storing by care of health at low temperature comparatively since an ester exchange reaction with a reactive silicon group or the (A4) ingredient is late is small and the orlying effect is high, it is desirable. Since group and does not contain an emino group is preferred Speatifically, elly,thrishovstlanes, auch as the property contained the property of the property of the property of the property and the property and the such as the defining effect, hardenshifts, availability, and the tension plysical properties of a hardened such as the defining effect, hardenshifts, availability, and the tension plysical properties of a hardened such as the definition of the property various kinds of compounds can be used. Since [that a change in physical properties after a silicon sellicon compound which has the Tori alkoxy silyl groups and does not contain an amino group has consists of an ingredient and a (G) ingredient. Especially as said dehydrator, it is not restricted but the higher drying effect, it is preferred, and especially a silicon compound that has a trimethoxysllyl (A4) A dehydrator may be added when using as a 1 liquid type constituent a constituent which

At this invention, it is a general formula as a (H) ingredient (8).: - SiR7 (OCH3) (OR8) 3-d-0 (8)

numbers 2-20 independently, respectively, d shows 0, 1, or 2 and e shows 1, 2, or 3.) However, 3-dformula, respectively, R⁸ of a 3-d-e individual is an organic group of monovalence of the carbon e>=0 shall be satisfied. An aminosilane coupling agent which has a basis expressed oan be used. General formula (6) which is the (A4) ingredient of this invention about this (H) ingredient : (d R7 is an organic group of monovalence of the carbon numbers 1-20 independently among a

end a reactant high methoxy silvi group generates to a reective silicon group of the (A4) ingredient. A hardenability constituent obtained as a result turns into a hardenability constituent of fast curability bssis expressed with (R4in formula is the same as the ebove), (H) An ester exchange reaction between If it is recuperated beforehand, a hardenability constituent added to en organic polymer which has a a methoxy silyl group of an ingradient and a reactive silicon group of the (A4) ingradient advances, while having outstanding adhesive property, stability, endurance, and creep resistance.

ngredient and a (A4) ingredient, Since it changes with existence of a trensesterification catalyst and (A4) ingredient, etc., are not generally decided, but as a transesterification catalyst, When it includes emperature service, the 10-30 ** thing for which it is recuperated comparatively one week or more ts addition, ester exchange reaction activity of a reactive silicon group of the (H) ingredient and the an organio tin catalyst or 0.5 copy - about three copies of TI system catalysts in a system, in a low is preferred, and it is preferred that more than a day recuperates itself in not less than 30 ** high (H) Desirable care-of-health conditions of said hardenability constituent which consists of an temperature service. (ii) Although it is usable as a many liquid L such as 1 liquid type and a two-component type. I type onestlydent, when it is constituent type. I type onestlydent, when it is constituent which onestly onestly of an ingedient and a (A4) impedient has a remerkable change of a cure rate especiable by sere of

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nore pieces are preferred, and its three pieces are more preferred. Therafora, a trimethoxysilyl group An ingredient is a compound which has a reactive silicon group expressed with a general formula A trimethoxysilyl group, a methyl dimethoxy silyl group, an ethyl dimathoxy silyl group, an ethoxy or the number of an alkoxy group combined with one silicon atom of a reactive silicon group, two or and an amino group. As an example of a reactive silicon group expressed with a general formula nethoxy silyl group, etc. can be mentioned. From a viawpoint of ester axchange reaction speed, as limethoxy silyl group, a dimethyl methoxy ailyl group, a diathyl methoxy silyl group, a diethoxy

as an example of an ingredient, (H) gamma—aminopropyl trimethoxysilane, gamma—aminopropyl methyl imethoxysilane, gamma-aminopropyl ethyl dimethoxysilane, gamma-aminopropyl ethoxy

s the most preferred.

aminocthyl) aminoethyl] aminopropyl trimathoxysilane, can be mantionad. A denatured derivative and gamma-(2-aminoethyl) aminopropyl ethoxy dimethoxysilane, gamma-ureldo propyltrimethoxysilane, penzyl-gamma-aminopropyl trimethoxysilane, N-n-butyl-gamma-aminopropyl trimethoxysilane, Ngamma-trimethoxysilylpropyl)athylenediamine, bis(trimethoxysilylpropyl)amine, and gamma-[2-(2gamma-ureido propylmethyl dimethoxysilane, N-phenyl-gamma-aminopropyl trimethoxysilane, Na condensation reaction thing of the above-mentioned silane compound can also use the above-/inylbenzyl gamma-aminopropyl trimethoxysilane, Amino group content Silang, such as N,N-bis śinethozysilane, gamma-(2-aminoethy) aminopropyl trimethozysilane, gamma-(2-aminoethy) aminopropyl ethyl dimethozysilane, gamma-(2-aminoethyl) aminopropyl ethyl dimethozysilane, nentioned silene compound as a (H) ingredient.

The (H) ingredient used for this invantion is used in 0.1-10 copies to 100 copies of organic polymers of the (A4) ingredient. It is preferred to use it in 1-5 copies especially. The above-mentioned (H)

in this invention, an epoxy resin can be used as a (1) ingredient. This epoxy resin has a function which aises stability, endurance, and oreep resistance further while improving impact strength and tough ingredient may be used only by one kind, and may carry out two or more kind mixing use.

nature of an organic polymer which are the (A4) ingredients of this invention.

spoxy resin, A glycidyl ether type epoxy resin of a bisphenol A propylene oxide addition, p-oxybenzoic As an spoxy resin used as a (!) ingredient of this invention, an epichlorohydrin bisphenol A type spoxy resin, Fre retardancy type spoxy resins, such as epichlorohydrin bisphenol F type spoxy resin and flaminodiphenylmethane systam epoxy resin, a urethane modified epoxy rasin, Various cycloaliphaticspoxy-resin and N,N-diglycidyl anilina, N,N-diglycidyl o-toluidine. Although an epoxidation thing of an glycidyl ether of tetrabromobisphenol A. Novolak type epoxy resin, a hydrogenation bisphenol A type unsaturation polymer, atc. are illustrated at the time, such as glyoidyl ether of polyhydric alcohol, a polyalkylene glycol diglycidyl ether, and glycerin. Not a thing limited to these but an epoxy resin hydantoin type epoxy resin, and petroleum resin, at the time, such as triglycidyl isocyanurate, soid glycidyl ether ester typed epoxy rasin, m-aminophenol series epoxy resin, A

spoxy resins or nevolak type spoxy resin is raised. Ranges of a using rate of these epoxy resin (0 and reactive silicon group containing organic polymer (A4) are (A4)/6 poxy resin = 100/1 - 1/100 in a weight ratio. (A4) if the improvement effect of impact strongth of an apoxy real in buddened material, useful nature, stability, andularance, and creep resistance becomes will be hard to accounted it a rate of a Apoxy real autoasses. 1001.1, intensity of a Apoxy rean surpasses 1001.1, intensity. of an organic polymer hardened material will become insufficient. Since a desirable using rate changes mproving intensity of a hardened material of the (A4) ingrediant, it is good to carry out 5-50 weight-section use of the spoxy resin five to 100 weight section still more prafarably especially one to 200 currently generally used is used, and it gets. What contains an epoxy group in it two I a molecule at least has high reactivity when hardening, and a hardened material is preferred from pointe—it is easy to build three-dimensional meshes of a not. As a still more desirable thing, bisphenol A type. mproving the shock resistance of an epoxy resin hardened material, flexibility, tough nature, peel praferably one to 100 weight section to epoxy resin 100 weight saction. On the other hand, when with uses of a hardenability constituent, etc., are not generally decided, but. For example, when strength, etc., it is good to carry out 5-100 weight-scotion use of the (A4) ingredient still mora

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weight section to (A4) ingredient 100 weight section.

used together. As an epoxy resin hardener which can be used, there is no restriction in particular and laturally a hardening agent which makes a constituent of this invention harden an epoxy resin can be Friethylenetetramine, tetraethylenepentamine, Diethylamino propylamine, N-aminoethyl piperidine, mlasses, such as isophoronediamine and amine end polyether, second class amines, 2,4,6-tris(dimethy) Anhydrous carboxylic acid; alcohols: phenols; carboxylic acid, such as DODESHINIRU succinyl oxide. sylylene damine, m-phenylenediamine, diaminodiphenylmethane, diaminodiphenyl sulfone, The first pyromellitic dianhydride, and anhydrous KUROREN acid; although compounds, such as a diketone complex compound of aluminum or a zirconium, can be illustrated, it is not limited to these. A aminomethyl) phenol, The third class amines like tripropylamine, and the salts: polyamide resin; midazole-derivatives; dioyandiamides of these third class amines; Boron trifluoride complex compounds. Phthalic anhydride, hexahydro phthalic anhydride, tetrahydro phthalic anhydride. an epoxy resin hardener currently generally used can be used. Specifically, for example pardening agent may also be independent or two or more sorts may be used together.

When using a hardening agent of an epoxy resin, the amount used is the range of 0.1 to 300 weight section to epoxy resin 100 weight section.

nave moisture, it exists stably, and it is decomposed into primary amina and katona by moisture, and produced primary amine servas as a hardaning agent of the room-temparature-curing nature of an epoxy resin. If katinine is used, a 1 liquid type constituent can be obtained. As such ketimine, it can Cetimine can be used as a hardening agent of an epoxy resin. In the state where ketimine does not

obtain by a condensation reaction of an amine compound and a carbonyl compound.

diaminobutane, pertamethylene diamine, 2,4-diaminopentane, Diamine,1,2,3-triamino propane, such as nexamethylenediamine, p-phenylene diamine, and p.p.-biphenylene diamine, Multivalent amine, such as Polyalkylene polyamine, such as TORIECHIREN triamine and tetraethylenepentamine; Polyoxyalkylene and banzaldehyde; Cyclopentanone, Oyolio ketone, such as trimathyl cyclopentanona, cyclohexanone, propionaldehyde, n-butylaldehyda, isobutyraldahyda, diathylacataldehyde, Aldehyde, such as a glyoxal series polyamine;gamma-aminopropyl triethoxysilane, Aminosilanes [, such as N-(beta-aminoethyl)and trimethyl cyclohexanone; Acetone, Methyl ethyl ketone, mathyl propyl ketone, methyl isopropyl ketone, Methyl isobutyl katona, a disthyl ketone, dipropyl ketone, diisopropyl keton, Aliphatic series riamino benzene, tris(2-aminoethyl) amine, and tetra(aminomethyl) methane; Diethylenetriamine, ketone, such as dibutyl ketone and disobutyl ketone; beta-dicarbonyl compound L such as an compound for composition of ketimine, As an amine compound, for example, ethylenediamine, gamma-aminopropyl trimethoxysilane and N-(beta-aminoethyl)-gamma-aminopropyl methyl Although what is necessary is just to use a publicly known amine compound and a carbonyl propylenediamine, Trimethylene diamine, a tetramethylenediamine, 1,3-diaminobutane, 2,3dimethoxysilane, J. etc. are used, and it gets. As a carbonyl compound, acetaldehyda,

glycidyl ester, such as styrene oxide; butyl glycidyl ether and allyl glycidyl ether, etc. Such ketimines weight-section use is carried out to epoxy resin 100 weight section, and the amount used changes When an imino group exists in ketimine, an imino group may be made to react to glycidyl ether. may be used independently, two or more kinds may be used together and used for them, 1-100 with kinds of an epoxy resin and ketimine.

acetylacetone, methyl acetoacatate, ethyl acetoacetate, dimethyl malonate, diethyl malonate, a

nalonic acid methylethyl, and dibenzoylmethane,]; etc. can be used.

silicio acid anhydrida, hydrous silicio acids, and oarbon black; Calcium carbonata, Bulking agents, such as magnesium carbonate, diatomite, calcination clay, clay, talo, titanium oxide, bentonite, organic pentonite, ferric oxida, a zinc oxide, an active white, and hydrogenation castor oil; fibrous fillers, such Various bulking agents other than a minute hollow body of the (F) ingredient may be blended with a hardenability constituent of this invention. It is not limited aspecially as said bulking agent, but For example, fumes silica, sedimentation nature alica, Reinforcement nature bulking agents, such as a

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asbestos, glass fiber, and a filament, are illustrated.

nainly chosen from tranium oxide, calcium carbonate, magnesium carbonate, tale, ferric oxide, a zinc carbonate, caloination clay, clay, an activa white, etc. is used in the range of 1 - 100 waight section oxide, etc. is used in the range of 5 – 200 weight section to organic polymer (A) 100 weight section. desirable result will be obtained if a bulking agent chosen from surface treatment detailed calcium Of course, those bulking agents may be used only by one kind, and may mix and use two or more To obtain a hardenability constituent with high intansity with these bulking agents. Mainly Fumes illos, sedimentation natura silics, a ailicic acid anhydride, hydrous silicic acids, carbon black, A constituent which is size with low strength, A desirable result will be obtained if a bulking agent to organic polymer (A) 100 weight section. When clongation wants to obtain a hardenability

enlarged or a lot of bulking agents can be mixed if a plasticizer is used, using it together with a in a hardenability constituent of this invention, since elongation of a hardened material can be bulking agent, it is more effective.

Distry/ene gyool dibenzoate, Glycol ester, such as pentaerythritol ester; Butyl oleste, Aliphatic series ester species, such as methyl acetyl ricinolate. Tricresyl phosphate, Phosphoric ester, such as As this plasticizer, dioctyl phthalate, dibutyl phthalate, Phthalic ester, such as butylbenzyl phthalate; paraffins, can use it independently arbitrarily in a form of two or more kinds of mixtures. A desirable esult will be obtained if the amount of plasticizers is used in 100 or less weight sections to organic oolyester plasticizer, polypropylane glycols, such as polyester of spoxy plasticizer, dibasic acid and lihydric alcohol, such as epoxidation linsced oil and epoxy stearic acid benzyl, and a derivative of polybutadione, Butadione Acrylonitrile, polychloroprene, polyisoprene, polybutene, and chlorinated Dioctyl adipata, Aliphatic dibasic acid ester, such as succinic acid isodecyl and dibutyl sebacate; ricetyl phosphate and phosphoric acid octyldiphenyl; Epoxidized soybean oil, Polyether, such as hose; Polly alpha-methylstyrene, Polystyrene, such as polystyrene; plasticizers, such as solymer (A) 100 weight section.

A polymeric plasticizer can be used. If a polymeric plasticizer is used, as compared with a case where polytetramethylene glycol, or these polyether polyol An ester group, polyether [, such as a derivative bebacic acid, Dibasic acid and ethylene glycol, such as adipio acid, azalaic acid, and phthalic acid, A property (it is also called paintwork) at the time of applying an alkyd paint to this hardened material dictivlene gycol, triativlane gycol, propylene gycol, A polyastar plasticizer obtained from ditydric alcohol, such as dipropylene gycol, 500 or more molecular weights, Further 1000 or mora a low molecule plasticizer which is a plasticizer which does not contain a polymer component in a nolecule is used, early physical properties are maintained over a long period of time, and drying system monomer as an axampla of a polymeric plasticizar, Distrylane glycol dibenzoato, Ester species of polyalkylane glycols, such as triethylane glycol dibenzoate and pentaerythritol ester; can be improved. A vinyl-base polymer producad by polymerizing by various methods in a vinyl methylstyrene,]., although polybutadiene, polybutene, polyisobutylene, butadiene acrylonitrile, changed into an other group etc.,]; -- polystyrene [. such as polystyrene and Polly alphapolyethylene glycols, a polypropylene glycol, A hydroxyl group of polyether polyol, such as polychloroprane, etc. are mentioned, it is not limited to these. [0291]

and weatherability, and a vinyl-base polymer are especially preferred. Also in a vinyl-base polymer, an obtained an acrylic-aoid-alkyl-estar systam monomer indicated to JP,2001–207157,A by continuation polyacrylic acid alkyl ester, are still more preferrad. Its molecular weight distribution is narrow, since acrylic polymer and/or an methacrylic system polymer are preferred, and acrylic polymers, such as preferred. Polyether and a vinyl-base polymer are preferred. A heat-resistant point to compatibility nypoviacosity-izing is possible for a synthetic mathod of this polymer, it is praferred, and it is still oolymerization method] It is preferred to use a polymer what is called by a SGO process which Among these polymeric plasticizers, a polymer of the (A) ingredient and a thing to dissolve are nore preferred. [of an atom-transfer-radical-polymerization mathod] [of a living-radicalnttp://www4.ipdlinpit.go.jp/cgi-bin/tran_web_cgi_ejje?atv_u=http%3A%2F%2Fwww4.ipdli... 2010/04/30

mass polymerization with an elevated temperature and high voltage.

although number average molecular weights of a polymeric plasticizer are 500–15000 preferably, the

preferably. It is 1000–3000 most preferably. If a molecular waight is too low, a plasticizer can flow out time, and alkyd paintwork cannot be improved. If a molecular weight is too high, viscosity will become plasticizer is not limited, a narrow thing is preferred and less than 1.80 arc preferred. 1.70 or less arc temporally by heat or a rainfall, aarly physical proporties cannot be maintained over a long period of are 800-10000 more preferably — further — desirable — 1000-8000 — it is 1000-5000 especially igh and worksbillty will worsen. Although molecular weight distribution in particular of a polymeric more preferred, in addition, 1.60 or less are preferred, 1.50 or less are still more preferred, 1.40 especially or less are preferred, and 1.30 or less are the most preferred.

A number average molecular weight of a polymeric plasticizer and molecular weight distribution Mw/Mn) are measured by the GPC method (polystyrene conversion). Although a polymeric plasticizer does not have a reactive silicon group, it may have a reactive silicor group. When it has a reactive silloon group, it acts as a reaction plasticizer and shift of a plasticizer molecule and one or lass piece and 0.8 more piece or less are preferred. When using a plasticizer from a hardened material can be prevented. When it has a reactive silicon group, it averages per

A plasticizar may be used alone and may use two or more sorts togather. A low molecule plasticizer and a polymerio plasticizer way be used together. These plasticizers can also be blended at the time group, the number everage molecular weight needs to be lower than a polymer of tha (A) ingredient (0.95). of polymer manufacture.

section preferably five to 150 weight section to (A) ingredient 100 weight section. In less than five The amount of plasticizer used is 20 - 100 weight section still more preferably ten to 120 weight weight sections, if an offect as a plasticizer stops being revealed and 150 weight sections are exceeded, mechanical strength of a hardened material runs short.

hydrocarbon group of the carbon numbers 1-20 independantly among a formula, respectively.) a is 0, 1. 2 or 3. A silicon compound shown may be added. Although limitation is not carried out, as said hardenability constituent of this invention. R₃Si(OR)₄₋₃ (R is substitution or an unsubstituted It is a general formula in order to improve the activity of a condensation ostalyst more in a

phenyldimethylmethoxysilane, Since the effect that what is an aryl group of the carbon numbers 6-20 more preferred. If loadings of a silicon compound are less than this range, an effect of accelerating a diphenyldimethoxysilane, diphenyl diethoxysilane, and triphenylmethoxysilane, is preferred. Especially diphenyldimethoxysilane and diphanyl diethoxysilane are low oost, and especially since they are easy sections are preferred to (A) ingredient 100 weight section, and its 0.1 - 10 weight section is still hardening reaction may become small. On the other hand, when loadings of a silicon compound to receive, they are preferred. As for loadings of this silicon compound, about 0.01-20 weight socelerates a hardening reaction of a constituent is larga, R in general formulas, such as exoced this range, hardness and tensile strength of a hardened material may fall. silicon compound Phanyltrimethoxysilane, Phenylmethyldimethoxyailane,

vinyldimethylmethoxysilana, gamma-aminopropyl trimethoxyailane, Tha alkoxysilane; silicone varnishes alkoxysilane, such as dimethyldimethoxysilane, trimethylmethoxysilane, and n-propyltrimethoxysilane Dimethyldi iso propenoxysilane, Alkyl iso propenoxysilane, such as methyl TORUSO propenoxysilane which have functional groups, such as N-(beta-aminoethyl) aminopropyl methyl dimethoxysilane. A physical properties regulator which adjusts the tractive characteristics of a hardened material generated if needed to a hardenability constituent of this invention may be added. Although not limited especially as a physical-properties regulator, for example Methyl trimetoxysilane, Alkyl methyldimethoxysllanc, gamma-glycidoxypropyltrimetoxysilane, Vinyltrimetoxysilane, and gamma-glycidoxy propylmethyl JISO propenoxysilane, gamma-glycidoxy propyl

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constituent of this invention is raised, or hardness is lowered conversaly end elongation after fracture olysiloxanes are mentioned. By using said physical properties regulator, hardness when stiffening a can be taken out. The above-mentioned physical-properties regulator may be used independently, gamma-mercapto propyltrimethoxysilane, and gamma-mercaptpropylmethyl dimethoxysilane;

and may be used together two or more sorts.

without worsening stickiness of the surface of a hardened material. A compound which generates ntramolecular by hydrolysis has the operation which reduces a modulus of a hardened material specially a compound that generates a compound which has a univalent silanol group in

tycerin, pentaerythritol, or sorbitol, are three or more, and generates R3SiOH **, such as a trimethyl sspecially a trimethyl silanol is preferred. A compound indicated to JP.H5-117521,A can be raised as ydrolysis, Trimethylolpropane indicated to JP,H11-241029,A, A compound which generates a silicon s compound which generates a compound which has a univalent silanol group in intramolecular by such as a hexanol, octanol, and decanol, and generates R₃SiOH **, such as a trimethyl silanol, by lydrolysis. A compound which generates a silicon compound which is a derivative of alkyl alcohol. compound which is a derivative of polyhydric alcohol whose numbers of hydroxyl groups, such as

A compound which generates a allicon compound which is a derivative of an oxypropylene polymer illanol, by hydrolysis can be raised.

hydrolysis can also be raised. A polymer which has a allicon content group which can serve as a monosiland content compound by a hydrolytic silicon content group and hydrolysis in which bridge which is indicated to JP,H7-256534,A, and generates R,SiOH(s), such as a trimathyl silanol, by construction furthermore indicated to JP.H6-279693.A is possible can also be used.

4 physical-properties regulator is preferably used in the range of 0.5-10 weight section 0.1 to 20

in a hardenability constituent of this invention, a lappet is prevented if needed, and in order to weight section to (A) ingredient 100 weight section.

These thixotropic grant agent (lappet inhibitor) may be used independently, and may be used together two or more sorts. A thixotropic grant agent is used in the range of 0.1 - 20 weight section to (A) improve workability, a thixotropic grant agent (lappet inhibitor) may be added. Although not limited derivative; calcium stearate, aluminum stearate, and barium stearate, is mentioned, for example, especially as a lappet inhibitor, metallic soap, such as polyamide wax: hydrogenation castor oil ingredient 100 weight section.

spoxy compound is good to use it in the range of 0.5 - 50 weight section to (A) ingredient 100 weight A compound which contains an epoxy group in one molecule in a constituent of this invention can be icid ester, alleyole fellows epoxy compounds, and an epichlorohydrin derivative as e compound which poxidation (inseed oil, a di(Z-ethylhaxyl) 4,5-epoxy cyclohexane-1,2-JIKABOKISHI rate (E-PS), poxy octyl stearate, epoxy butyl stearate, etc. are raised. Especially in these. E-PS is preferred. An used. If a compound which has an epoxy group is used, the stability of e hardened material can be mproved. Compounds shown in epoxidation unsaturation oil and fat, epoxidation unsaturation fatty as an epoxy group, those mixtures, etc. oan be illustrated. Specifically, epoxidized soybean oil,

of a hardened material, and dust is carried out. Drying oil represented with tung oil, linseed oil, etc. by naterial, and an operation of preventing adhesion of stickiness of the surface, garbage on the surface oolybutadiene produced by making oarry out copolymerizetion, Liquefied polymers, such as a polymer compound. An acrylic polymer which denaturalized with drying oil, Epoxy system resin, silicon resin; example of an oxygen hardenability substance, Various alkyd resins produced by deneturalizing this An oxygen hardenability substance can be used for a constituent of this invention. To an oxygen Sutadiene, ohloroprene, isoprene, Diene series, such as 1,3-pentadiene, a polymerization or 1,2lardenability substance, an unsaturated compound which can react to oxygen in the air can be llustrated, it reacts to oxygen in the air, a cured film is formed near the surface of a hardened

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Whese, tung oil and a liquished diene system polymer are preferred. Concomitant use of a outskyst and a metal drier which promote an outsid to hardwaing reaction may helighten an effect. As these catalysts and metal driers, metal salt, such as cobalt naphthesite, leaf naphthesite, a naphthesite, as paphthesite. diene aeries may serve es a subjact, Liquefied copolymera, those various denaturation things, etc. (a weight section. If an improvement of stain resistance becomes less enough when said amount used tractive characteristics of a hardened material, etc. to be spolled will arise. An oxygen hardenability of 1,4-polybutadiene. C5 - C8 diene. NBR produced by making carry out copolymerization of these diene series and the monomers which have copolymeric, such as acrylonitrile and atyrene, so that mallein-ized denaturation thing, a boiled oil denaturation thing, etc.), such as SBR, are mentloned. These may be used independently and may be used together two or more sorts. Especially among illustrated. It is at best still more preferred to use it in the range of 0.1 - 20 weight section to (A) ingredient 100 weight section, and the amount of oxygen hardenability substance used is 0.5 - 10 substance is good to use it, using together with a photoresist substance as indicated to JP,H3will be less than 0.1 weight sections, and 20 weight sections are surpassed, a tendency for the acid zirconium, octylic acid cobalt, and an octylic acid zirconium, an amine compound, etc. are

A photoresist substance can be used for a constituent of this invention. If a photorasist substance is used, a coat of a photoresist substance is formed in the hardened material surface, and stickiness of substance produces physical-properties change of hardening etc. Many things, such as e constituent partly, It is mixtures, such as oligomer or it, and monomers, such as propylene (or butylene, ethylene) QURIKORUJI (meta) acrylate and neopentyl GURIKORUJI (meta) dimethacrylate, or with a molecular ARONIKKUSU M-210 (2 Functional). ARONIKKUSU M-215, ARONIKKUSU M-220, ARONIKKUSU Mlight, molecular structure causes a chemical change considerably for a short time, and a photoresist s hardened material and the weetherability of a hardened material can be improved. By operation of containing an organic monomer, oligomer, resin, or them, are known by this kind of compound, and compound, acrylic or an methacrylic system unsaturation group 1 thru/or a monomer which it has compound, polycinnamic acid vinyl, or azide-ized resin can be used. As an unsaturation acrylic weight of 10,000 or less oligoesters is illustrated. Specifically, For example, special acrylate. commercial arbitrary things can be adopted as it. As a typical thing an unsaturation acrylic

llustration -- these -- a sensitizer can be used, being able to mix and adding [it can be independent, and amines, may heighten an effect. A photoresist substance is good to use it in the range of 0.5 - 10 cinnamic acid is illustratod, Azide-izad resin is known as a photopolymor which uses an azido group as a sensitization group, usually, a "photopolymer" (Shows 47(1972) — on March 17) besides [which A polycinnamic acid vinyl derivative of many besides what is a photopolymer which uses a cinnamoy weight section preferably 0.1 to 20 weight section to (A) ingredient 100 weight section, and in 0.1 or ess weight section, since there is no effect which improves weatherability, and a hardened material or] if needed. Addition of accelerators, such as sensitizers, such as ketone and a nitro compound, added a diazido compound as a sensitizing agent] a rubber sensitizing solution [and] printing accomes hard too much and produces a cracking crack in 20 or more weight sections, it is not group as a sensitization group as polycinnamic acid vinyl, and esterified polyvinyl alcohol with society publication part issue, and the 93rd page - 106th page - 117th page - have detailed product of Toagosai ohemical Industry incorporated company ebove.)

containing especially an acrylic functional group is preferred, and a compound which averages in one molecule and contains the three or more functional groups is preferred. (Each ARONIK/USU is a

ARONIKKUSU M-309, ARONIKKUSU M-310, Although ARONIKKUSU M-315, ARONIKKUSU M-320,

ARONIKKUSU M-325, (polyfunctional) ARONIKKUSU M-400, etc. can be illustrated, a compound

233. ARONIKKUSU M-240, ARONIKKUSU M-245; (three organic functions) ARONIKKUSU M-305.

used, the weathershility of a hardened material can be improved. Although a hindered phenol system, An antioxidant (antiaging agent) can be used for a constituent of this invention. If an antioxidant is antioxidant, especially a hindered phonol system is preferred. Similarly. Tinuvin 622LD, tinuvin 144; a mono- phenol system, a bisphenol system, and a polyphanol system can be illustrated ea en

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CHIMASSORB944LD, CHIMASSORB119floor line (all are the Ciba-Geigy Japan, Inc. make above);

114, and SANORU LS-744 (all are the Sankyo Co., Ltd. make above) can also be used. An example shown in SANORU LS-770, SANORU LS-765, SANORU LS-292, SANORU LS-2626, SANORU LSpreferred to use it in the range of 0.1-10 weight saction to (A) ingredient 100 weight saction, and an antioxidant is indicated also to JP,H4-283259,A or JP,H9-194731,A. It is at best still more ADEKAAGASU chemicals incorporated company make above);. A hindared amine light stabiliser he amount of antioxidant used is 0.2 - 5 weight section.

photooxidation degradation of a hardened material can be prevented. Although a benzotriazol system, i hindered amine system, a benzoate system compound, etc. can be illustrated as light stabilizer, light stabilizer can be used for a constituent of this invention. If light stabilizer is used,

sspecially a hindered amine system is preferred. It is at best still more preferred to use it in the range of 0.1 - 10 weight section to (A) ingredient 100 weight section, and the amount of light stabilizer used 0.2 - 5 weight section. An example of light stabilizer is indicated also to JP,H9-194731,A.

stabiliser as a hindered amine light stabiliser as indicated to JP.H5-70531 A because of preservation constituent of this invention, it is preferred to use a tertiary amine content hindered amine light When an unsaturation acrylic compound is used especially as a photoresist substance in a

atability improvement of a constituent. As a tertiary amine content hindared amine light stabiliser. ** tinuvin 622.D and tinuvin 144; OHIMASSORB118Noor line, (All are the Olba-Gelgy Japan, Inc. make above),MARKI.A-67, I.A-62, I.A-67, I.A-63 (#I are ADEKAAGASU chemicals incorporated company make above); SANORU LS-765, LS-282, LS-2828, LS-1114, LS-744, (All are the Sankyo Co., Ltd

make above) etc. — light stabilizer can be illustrated.

weight section to (A) ingredient 100 weight section, and the amount of ultraviolet ray absorbent used by C. S. Sweight section. It is prefer the use together and use a phenol system is influented phenolic antioxidant, a landered swinte light stabiliser, and a benzodratol system ultraviolet twy basedhent. benzophenone series, a benzotriazol system, a salicylate series, a substitution tolyl system, a metal benzotriazol system is preferred, it is at best still more preferred to use it in the range of 0.1 - 10 absorbent is used, the surface weatherability of a hardened material oan be improved. Although a An ultraviolet ray absorbent can be used for a constituent of this invention. If an ultraviolet ray chelate system compound, etc. can be illustrated as an ultraviolet ray absorbent, especially a

pardenability constituent of this invantion, for example, was described above is blended, it kneads dissolved using a little suitable solvents, a usual method of mixing is adopted, and it gats. A many iquid [such as 1 liquid type and a two-component type,] type compound can also be made and under ordinary temperature or heating using a mixer, a roll, a kneader, etc., or an ingredient is An ingredient which limitation in particular does not have in the method of preparation of a

moisture, it will form network structure in three dimensions, and will harden it promptly to a solid if a hardenability constituent of this invention is exposed into the atmosphere, by operation of used by combining these ingredients autably.

it faces using a hardenability constituent of this invention, if needed Adhesive improving agents other than an aminosilane, a physical-properties regulator, it is possible to add suitably various additive desotivator, anti-ozonant, light stabilizer, amine system radioal chain inhibitor, the Lynn system agents, such as a preservation stability improving agent, an ultraviolet ray absorbent, a metal which has rubber-like elasticity.

A hardenability constituent of this invention can be used for sealant, such as a binder, a building, a marine vesaci, and a super highway, adhesives, modeling material, a vibroisolating material, a sound deadoner, a sound insulating material, a charge of foam, a paint, a gunning material, etc. Electrical peroxide decomposition agent, lubricant, paints, and a foaming agent.

nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdi1... 2010/04/30 nsulation materials, such as electric electronic component matarials, such as a solar cell rear-face nsaling agent, pre-insulation an electric wire, material for cables, Elastic adheaivas, powder coatings,

large area, such as glass, porcelain, wood, metal, and a resin-molding thing, it is usable also as various in various molding materials and wired sheet glass and a sealing agent for rust prevention / water proof of the glass laminate end face (out section), autoparts, electrical machinery parts, several kinds material for masonry joints of sheathing materials, such as a medical equipment aealant, food packing from excelling in stability, endurance, and creeping property. Adhesives for interior panels, adhesives electric electrons, a film, a gasket, it is available for various uaas, auch as a fluid-aealant agent used of machine part, etc. Since, or help of a primer is borrowed and it may stick to substrates of a **** finishing adhesives, adhesives for finishing of wall, adhesives for car panels, it is desirable, especially precision-mechanical-equipment assemblies, a sealing material for direct grazing, a sealing material for multiple glass, a sealing material for speed signal generator construction methods, or a sealing seal constituents and adhesion constituents of a type. A hardenability constituent of this invention material, and a sizing board, A coating material, a primer, a conductive material for electromagnetic wave cover, a thermally conductive material, A charge of a hot melt material, a potting agent for for face panels, adhesives for tiling, adhesives for stone tensions, Ceiling finishing adhesives, floor when it is considered as the electrical and electric equipment, an electron and adhesives for pasting material, a medical-application rubber material, a medical-application binder, A sealing material for working joint of a building and uses.

Although working example is hung up over balow and this invention is explained to it in more dotail, this invention is not limited only to these working example. [Example]

0315

Use polyoxypropylene triol of the molecular weight 3,000 [about] as an initiator, and propylene oxide molecular weight about 26,000 (polystyrene reduced molecular weight in which the column measured the solvent using THF using the TOSOH TSK-GEL H type using TOSOH HLC-8120GPC as a liquidequivalent was added 1.2 times to the hydroxyl group of this hydroxyl group end polypropylene oxide, and methanol was distilled off, and also the ally chloride was added, and the hydroxyl group of the serving out mixed stirring of the water 300 weight section and centrifugal separation removed water unctions polypropylene oxide of the number average molecular weight 26,000 [about] which is an obtained], n-hexane 300 weight section, After it carried out mixed stirring of the water 300 weight end was changed into the allyl group. Decompression devolatilization removed the unreacted allyl achoride. To allyl end polypropylene oxide 100 weight section which is not refined [which was is polymerized in a zinc hexa cyanocobaltate glyme complex compound catalyst. Number average gain, decompression devolatilization removed hexane. By the above, the end obtained 3 organiosending system) polypropylene oxide was obtained. Then, the methanol solution of NaOMe of the section further at the hexane solution obtained by centrifugal separation removing water after (Synthetic example 1)

measures in a CDCl₃ solvent using JEOL JNM-LA400) averaged the methyl dimethoxy silvl group of react to methyl dimethoxysilane 1.4 weight section at 90 ** for 5 hours, and the methyl dimethoxy made into a catalyst to allyl end polypropylene oxide 100 obtained weight section, it was made to 150 ppm of platinum content 3wt% of platinum vinyl siloxane complexes isopropanol aclutions are silyl group end polyoxyalkylene series polymer (A-1) was obtained. Messurement by ¹H-NMR (it the end per molecule, and they were 2.3 pieces. 0316

(The reference example 1, working example 2-4, and comparative examples 1-2)

duplexs, and light stabilizar (the Sankyo make.) SANORU LS7701 weight section and an ultraviolet ray absorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product made from Ouchi Shinko Chemical industry, NOKURAKKU SP) 1 weight aaction, The amount part of colloid calcium carbonate (product made from Shiraishi industry, Hakuenka CCR) 120 weight section Tranium oxide (Ishihara Sangyo make, TIPAQUE R-820) 20 weight saction, DIDP55 weight section. the amount part of thixotropic grant agent (made in [Kusumoto Chemicals], DISUPARON 6500) synthetic example 1 according to the combination formula shown in Table 1. Surface treatment Organic polymer (A-1) 100 weight section which has the reactive silicon group obtained in the

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16)

150 150 150 the dibuty/tin bisacety/acetonate (trade name: U-220); Japanese east -- transformation -- make and the product made from nee dacanoic acid tin (divalent) (trade name: U-50); Japan apoxy reain.) given in the amount part of methylsilicate 51 duplexs, and Table 1 Neo decanoic acid (trade name: BASA aminoethyl)-gamma-aminopropyl trimethoxysllane (the Nippon Unicar maka.) A-1120) silicate (made Jehydrator vinyltrimetoxysilana (Nippon Unicar make, A-171) duplexs, adhesion grant agent N-betan a col coat.) given in three weight sections and Tabla 1 Made in an ethyl silicate 28; col coat, ethyl silicate 40; Made in a col coat, a curing catalyst (the Japanese east -- transformation -- make and substantially under drying conditions, it sealed in the dampproof container and 1 liquid mold-curing parried out number-of-copies addition, after kneading in the state where moisture does not exist tick 10); the description to Table 1 of the Wako Pure Chemical Industries make and lauryl amine nature constituent was obtained.

Hauling physical properties of a hardened material)

[0318]

type, and having pulled by a part for 200-mm/in hauling speed, and was extended at the time of intensity (MPa) and Eb:fracture at the time of M50:50% hauling modulus (MPa) and Tb:fracture, and (%) It was 23 **x3 +50 **x recuperated in the class product of Table I on the 4th, and the sheet about 3 mm thick was created. [per day] It examined by having pieroed this sheet to the No. 3 dumbbell was measured. A result is shown in Table 1.

It was 23 **x3 +50 **x recuperated in the class product of Table 1 on the 4th, and the sheet about 3 mm is pulled to 40 mm between the marked lines (100% extension), it fixed at 60 ** for 24 hours. The recovery was measured from the rate which opened this wide at 23 ** and the marked line restored I hour afterward. It means that the one where the recovery is larger is excellent in stability. A result mm thick was created. [per day] This sheat was pierced to the No. 3 dumbbell type, and where 20 is shown in Table 1. Recovery)

Creep measurement using the piece of a dumbbell)

it was 23 **x3 +50 **x recuperated in the class product of Table 1 on the 4th, and the sheet about 3 nm thick was created [per day] This sheet was pierced to the No. 3 dumbbell type, and the marked where a displacement difference is smaller is excellent in orecp resistance. A result is shown in Table ine of 20 mm of intervals was described. The end of this piece of a dumbbell was fixed in 60 ** oven, narked lines of 200 hours after immediately after imposing load was measured. It means that the one ower end of the hung piece of a dumbbell. The displacement difference of the distance between the nentioned tension physical-properties measurement of this hardened material was imposed on the and the piece of a dumbbell was hung. 0.4 time as much load as M50 value obtained by the above-

[0321]

Table 1

bb	001/	Z6Z	(%)	4 3		
2.6	72.27	2,00	(BPA)	dТ		
7.0	97 '0	0.53	(BPa)	M 2 0	種化物物性	
Т	9.1	1.61	(ww)	£-1		
3	1/8	1/9	(%)	率元	彰	
.1 7.0	97.0		くきよがいかで	₹.		
T.	2.1		014%17#- N	続く、木小木		
3.	3.4		09-U<\$\f\\$	岀 .४४額ペ *44t		
		7	447570-220	-XX数青	硬化触媒	
			134-40/44			
7			044-40<44I			
	7	7	824-4(\<\1\frac{1}{4}\frac{1}{4}	宋禄 (四)	イーセルぐ	
3	3	3	0211-A	除亳付业着新		
7	7	7	ITI-A	廃水朔		
Į.	1	Į.	4844541	除土初		
Į.	I.	1	FXE' >327	隋如梁縣代業		
ļ.	1	I.	0LL-S74-/#	隋宝安光		
7	7	7	0089# <u '="" 't<="" td="" x\=""><td>性付与剤</td><td></td></u>	性付与剤		
99	99	99	9010	 	[E	
50	50	20	94v4K-850			
15	150	150	ROO華護白	林鄭尭		
101	100	100	F — A	会 類 (A)	朴合重樹青	
3	7	1				
前実	阿寿参 (陪量重) 丸脉					

silicata. As shown in the comparativa example 2, when carboxylic acid tin salt (neo SUTAN U-50) etc. shown in the reference example 1, stability and creep resistance are notably improved by addition of are used, not using organic tin (U-220) as a ouring catalyat, stability and croop resistance also with good silicate additive-free are shown, but. As shown in working exampla 2-4, atability and creep catalyst, especially the recovery of creep resistance is low bad silicate additive-free. However, as As shown in the comparative example 1 of Table 1, when organic tin (U-220) is used as a curing esistance further outstanding by silicate addition were shown. The cthyl silicate 40 and the

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nethylsilicate 51 which were used in working exampla 3-4 are a condensate of a tetraethoxysilane and a tetramethoxy silane, respectively, and showed the especially outstanding affect.

group and polypropylene oxide of the number average molecular weight 14,500 [about] produced by Jaa polyoxypropylene glycol of the molecular weight 2,000 [about] as an initiator, and the hydroxyl used, Allyl end polypropylene oxide was obtained in the same procedure as the synthetic example 1. polymerizing propylene oxide in the zinc hexa oyanocobaltate glyma complex compound catalyst is Synthetic example 2)

o this allyl end polypropylene oxide. in the same procedure as the synthetic example 1, it was made to react to trimethoxysilane and the polyoxyalkylone series polymer (A-2) which has an average of .5 trimethoxysilyl groups at the end was obtained.

Synthetic example 3)

To the allyl end polypropylene oxide obtained in the synthetic example 2, in the same procedure as the synthetic example 1, it was made to react to triethoxysilane and the polyoxyalkylene series

polymer (A-3) which has an average of 1.5 triethoxy silyl groups at the end was obtained (Synthetic example 4)

To the allyl and polypropylene oxide obtained in the synthetic example 2, in the same procedure as the synthetic example 1, it was made to react to methyl dimethoxysilane and the polyoxyalkylene series polymer (A-4) which has an averaga of 1.5 methyl dimethoxy silyl groups at the end was obtained.

(The reference examples 5-11 and comparative examples 3-5)

Juplexs, and light stabilizer (the Sankyo make.) SANORU LS7701 weight section and an ultraviolet ray colloid calcium carbonate (product made from Shiraishi industry, Hakuenka OCR) 120 weight section, Jehydrator vinyltrimetoxysilane (Nippon Unicar make, A-171) duplexs, adhesion grant agent N-betanade from Ouchi Shinko Chemical industry, NOKURAKKU SP) 1 weight section, The amount part of Tranium oxide (Ishihara Sangyo make, TIPAQUE R-820) 20 weight section, DIDP12 weight section, Organic polymer (A-2-4) 100 weight section which has the reactive silicon group obtained in the synthetic examples 2-4 according to the combination formula shown in Table 2, Surface treatment he amount part of thixotropic grant agent (made in [Kusumoto Chemicals]. DISUPARON 6500) absorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product

U-220), the Sarkyo Organic Chemicale make, a dibutyltin JIRAURI rate (trade name: STANN BL.)) of the (D) ingredient given in Table 2, or the curing catalyst (the Japanese east — transformation make, of the (G) ingrediant The description to Table 2 of neo dacanoic acid tin (divalent) (trade name: U-50) and amina (the Wako Pure Chemical Industries make, lauryl amine) carried out numberaminoethyl)-gamma-aminopropyl trimethoxysilane (the Nippon Unicar make.) A-1120) Three weight curing catalyst (Japanese east transformation make and dibutyitin bisacetylacatonate (trade name: of-copies addition, after kneading in the state where moisture does not exist substantially under drying conditions, it sealed in the dampproof container and I liquid mold-curing nature constituent sactions, number of copies given [silicate (made in a col cost, methylsilicate 51)] in Table 2, the

was obtained.

t examined by having pulled by the same method as the above-mentioned using the class product of Table 2, and was extended at the time of intensity (MPa) and Eb/fracture at the time of M50:50% hauling modulus (MPa) and Tb/fracture, and (%) was measured. A result is shown in Table 2. The recovery was measured by the same method as the above-mentioned using the class product of Table 2. However, the stratched state was fixed at 23 ** 100% for 24 hours this time, and the recovery was measured from the rate which opened this wide at 23 ** and the marked line restored I hour afterward. A result is shown in Table 2.

The displacement difference with the 140-hour back immediately after creating the ** sample which (Creep measurement using a shear sample)

http://www4.ipdl.inpit_go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/04/30

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0.4 mm, and the displacement difference carried out a thing of 0.4 mm or more. A result is shown in is not carried an area of 20 mm x 25 mm and 1 mm in thickness using the class product of Table 2, imposing 0.1MPs load for what recuperated [23 **x3 +50 **x] itself on the 4th in 60 ** oven, and imposing load was measured. [par day] The displacement difference made O x for the thing below

Table 2

http://www4.ipdl.inpit.go.jp/ogi-bin/tran_web_ogi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/04/30

370	340	598	912	7.91	208	802	184	961	163	(%)		93		
2,70	2.84	2, 83	2, 18	2.20	80.2	2.35	2.61	2, 20	2.24	(sqll)		9 1		
28.0	68.0	10.1	76.0	91.1	0.92	26.0	1.13	96 '0	\$6.0	(s9M)		0 9 W	硬化物物件	
×	×	×	0	0	0	0	0	0	0			(樹入廿)		
79	LV	<i>L</i> 9	96	96	76	63	63	63	63	(%)		率元獻		
			97.0							CELMIGE		7.5.5		
			3.4		_					09-0<424		会類(2)		
3					3			6.0		Stann BL		€% (a)		
	7	2.0		2		7	2.0		0.2		\$4¥\$>N-550		凝的小頭	
				7_						191-46614	1	代 類(日)	4-464	
3	3	3	3	8	3	3	3	3	3	0211-A		 		
7	2	7	2	7	2	7	7	7	7	171-A		廃水號		
T	1	ı.	I.	ı.	I.	1	1	1	ı		424%E41		JY頻	
1	ı	T	_	1	I	- 1	1	1	1	£35, >351				
1	1	1	T	1	1	1	ı	-	ı	0LL-S74-7				
7	7	7	2	7	2	7	7	7	2	±, ⟨YV. ¤> #6500		子 りい 体付 手刻		
15	12	15	15	15	15	15	12	12	15	d010		権 [1]		
20	20	50	50	50	50	50	20	20	50	94v48-850				
120	120	150	150	120	150	120	120	150	150	900華體白		林軟疣		
100	100	100								基机吹针、以积			1	
			100	100	100	100	100	-		基机代料工厂	ε-Α			
								100	100	基机岭科机	S-A	会類(FA)	 本会重観音	
9	Þ	3	11	10	6	8	L	9	ĝ	監幕の基				
	比較到					學者例			素トヤ卦為夏		(語量重) 魚路			

When the reactiva silicon group of an end uaes the organic polymer (A–2–3) which is the Tori alkoxy examples 3-5, stability and oreep resistance are improved notably. The reference example 10 which added silicate, and the reference example 11 using carboxylic acid tin saft (neo SUTAN U-50) as a silyl groups from comparison with the reference examples 5-9 of Table 2, and the comparative

(Synthetic example 5)

curing catalyst showed the further outstanding recovery.

To the allyl end polypropylene oxide obtained in the synthetic example 1, in the same procedure as the synthetic example 1, it was made to react to methyl dimethoxysilane and the polyoxyalkylene series polymer (A-5) which has an average of two methyl dimethoxy silyl groups at the end was

Synthetic example 6)

group end polypropylene oxide of the number average molecular weight 26,000 [about] produced by under the atmosphere of the nitrogen to contain, it was made to react to mathyl dimethoxysilane 3.2 used, Metallyl end polypropylane oxide was obtained in the same procedure as the synthetio example polymerizing propylene oxide in the zino hexa cyanocobaltate gyme complex compound catalyst is Use polyoxypropylene triol of the molecular weight 3.000 [about] as an initiator, and the hydroxyl slatinum vinyl siloxane complexes isopropanol solution is made into a catalyst to this metallyl and polypropylene oxida 100 weight section, oxygen --- 6vol% --- mixed sulfur at a rate of 1 eq/Pt1eq except making an allyl chloride into chloridation metallyl. 0.5 copy of platinum content 3wt% of weight section at 90 ** for 5 hours, and the polyoxyalkylene series polymer (A-6) which has an average of 2.8 methyl dimethoxy silyl groups at the end was obtained.

(The reference examples 12-14 and comparative example 6) 0334

soction, Carboxylic acid (troduct made from Japan cpoxy resin, neo decanoic acid (trade nama: BASA tick 10)) 1.2 weight section and amine (Wako Pure Chamical Industries make, Isuryl amine) 0.75 Organic polymer (A-1, A-4-6) 100 weight section which has the reactive silicon group obtained in the weight section, DIDP55 weight section, the amount part of thixotropic grant agent (made in [Kusumoto Chemicals], DISUPARON 6500) duplexs, and light stabilizer (the Sankyo make.) SANORU 5P) I weight section, As the amount part of dehydrator vinyltrimetoxysilane (Nippon Unicar make, Asynthetic example 1 and the synthetic examples 4-6 according to the combination formula shown in LS7701 weight section and an ultraviolet ray absorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product made from Ouchi Shinko Chemical industry, NOKURAKKU (Japanese east transformation make, neo decanoic acid tin (divalent) (trada name: U-50)) 3.4 weight weight section are edded, After kneading in the state where moisture does not exist substantially Hakuenka CCR) 120 weight section, Titanium oxide (Ishihara Sangyo make, TIPAQUE R-820) 20 17) duplexs, adhasion grant agent N-bata-(aminoethyl)-gamma-aminopropyl trimethoxysilane (Nippon Unioar make, A-1120) 3 weight section, and a curing catalyst, Carboxyiic acid tin salt able 3, Surface treatment colloid calcium carbonate (product made from Shiraishi industry, under drying conditions, it scaled in the dampproof container and 1 liquid mold-curing nature

constituent was obtained. 0335]

t examined by having pulled by the same method as the above-mentioned using the class product of Table 3, and was extended at the time of intensity (MPa) and Ebdracture at the time of M50:50% nauling modulus (MPs) and Tb:fracture, and (%) was measured. A result is shown in Table 3. 03361

The recovery was measured by the same method as the above-mentioned using the class product of Table 3. However, the stretched state was fixed at 60 ** 100% for 24 hours this time, and the recovery was measured from the rate which opened this wide at 23 ** and the marked line restored 1 hour afterward. A result is shown in Tabla 3. The displacament difference of the distance between the marked lines of 200 hours after immediately after performing cresp measurament using the piece of a dumbbell, and imposing load using the class

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product of Table 3, by the same method as the method of the reference example 1 and working

example 2-4, was measured. A result is shown in Table 3.

205	273	483	109	(%)		EР	_	
				(RPA)		91	1	
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86.0	89.0	0.43	98.0	(MPa)		0 9 W	硬化物物性	
3.2	1.3	2.2	2.5	(ww)		L-1		
13	98	T8	84	(%)		率元	重	
9/ '0	GT.0	97.0	94.0	45F4114F		CEL		
1.2	1.2	1.2	1.2	0146744- M		参西く "ホル 化		
3.4	3.4	3.4	3.4			型、XX麵(**41t		
3	3	3	3	0211-A		南 すか :	1 茶新	
7	7	7	7	171-A		(南水		
	ī	i	1	4346 <u>6</u> 41		廃土表	小顔	
	1	1	1	£3F. >351		隋邓规	辭代業	
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99	99	99	99	DIDP		廃壁	[b	
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			100	图0.2	9-∀	长類(SA)	 本合重 数 1	
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附鏈出		學表例		のいうむ千代 (陪量重) 漁路			¥	

Comparison with the reference examples 12-14 of Table 3 and the comparative example 6 shows that the organic polymer with many reactive silicon groups par molecule (A-1, A-5-6) is excellent in stability and oreep resistance. nttp://www4.ipdl.inpit.go.jp/cgi-bin/tran_wab_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/04/30

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(Synthetic example 7)

group and polypropylane oxide of the number average molecular weight 28,500 [about] produced by polymerizing propylane oxide in the zinc hoxa cyanocobaltate glyme complex compound catalyst is used, Metallyl end polypropylene oxide was obtained in the same procedure as the synthetic example 6. To this metallyl and polypropylene oxide, in the same procedure as the synthetic example 6, it was made to react to methyl dimethoxysilane and the polyoxyalkylene series polymer (A-7) which has an Jse polyoxypropylana glycol of the molacular weight 2,000 [about] as an initiator, and the hydroxy

average of 1.9 methyl dimethoxy silyl groups at the end was obtained. (Synthetic example 8)

To the metallyl end polypropylene oxide obtained in the synthetic example 7, in the same procedure as the synthetic example 6, it was made to react to methyl dimethoxysilane and the polyoxyalkylene scries polymer (A-8) which has an average of 1.5 methyl dinethoxy silyl groups at the end was

(Synthetic example 9)

group end polypropylene oxide of the number everage molecular weight 28,500 [about] produced by used, Ally and polypropylene oxide was obtained in the same procedure as the synthetic example 1. To this allyl end polypropylene oxide, in the same procedure as the synthetic example 1, it was made Use polyoxypropylene glycol of the molecular weight 2,000 [about] as an initiator, and the hydroxyl polymerizing propylene oxide in the zinc haxa cyanocobaltate glyme complex compound catalyst is to react to methyl dimethoxysilana and the polyoxyalkylane series polymer (A-9) which has an average of 1.5 methyl dimethoxy silyl groups at the end was obtained.

(The <u>reference examples 15-16 and comparative examples 7-8)</u> Organic polymer (A-4, A-7-9) 100 weight section which has the reactive silicon group obtained in the

Table 4, Starfiere treatment collicio disolari controlari controlari controlari in distributi industry, industributi collicio disolari controlari controla synthetic example 4 and the synthetic examples 7-9 according to the combination formula shown in 3271 weight section, antioxidant (product made from Ouchi Shinko Chemical Industry, NOKURAKKU dibutyltin bisacetylecatonate (Japanese east transformation make, neo SUTAN U-220) duplexs were 71) duplexe, adhesion grant agent N-beta-(aminoethyl)-gamma-aminopropyl trimethoxysilane (the SP) 1 weight section, The amount part of dehydrator vinyltrimetoxysilane (Nippon Unicar make, Aadded, after kneading in the state where moiature does not exist aubstantially under drying conditions, it sealed in the dampproof container and 1 liquid moid-curing nature constituent was lippon Unicar make.) A-1120) Three weight sections and the amount part of ouring catalyst

It examined by having pulled by the same method as the above-mentioned using the class product of Table 4, and was extended at the time of intensity (MPa) and Eb-fracture at the time of MS0-50% hauling modulus (MPa) and Tb-fracture, and (%) was measured. A result is shown in Table 4.

The recovery was measured by the same method as the above-mentioned using the class product of recovery was measured from the rate which opened this wide at 23 ** and the marked line restored Table 4. However, the stretched state was fixed at 23 ** 100% for 24 hours this time, and the 24 hours afterward, A result is shown in Table 4.

The displacement difference of the distance between the marked lines of 45 hours after immediately 0346

after performing oreon measurement using the piece of a dumbbell, and imposing lead uning the class product of Table 4, by the same method as the method of the reference assemple 1 and working example 24, was measured. A result is shown in Table 4.

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(%)

Comparison with the reference examples 15-16 of Table 4 and the comparative examples 7-8 shows

403

hat the organic polymer (A-7-8) which introduced the reactive silicon group to the metallyl group To the allyl end polypropylene oxide obtained in the synthetic example 1, in the same procedure as the synthetic example 1, it was made to react to triethoxysilane and the polyoxyalkylene series and organicity polymer is excellent in atability and creep resistance. Synthetic example 10)

ofymer (A-10) which has an average of 2.3 triethoxy silyl groups at the end was obtained. The reference example 17 and the comparative examples 9-10)

1350

nade from Ouchi Shinko Chemical Industry, NOKURAKKU SP) 1 weight section, As a dehydrator, the Organio polymer (A-1, A-10) 100 weight section which has the reactive silicon group obtained in the able 5, Surface treatment colloid calcium carbonate (product made from Solvay, Winnofil SPM) 120 weight section, Titanium oxide (product made from Kerr-MoGee, RFK-2) 20 weight section, DIUP50 weight section, Thixotropic grant agent (product made from Cray Valley, Crayvallac super) 5 weight riethoxysilane (the Nippon Unioar make.) which is the (G) ingradiant as an adhesion grant agent Asynthetic example 1 and the synthetic example 10 according to the combination formula shown in 100) Or add N-beta-(aminoethyl)-gamma-aminopropyl trimethoxysilane (Nippon Unioar make, Aabsorbent (made in Tiba Specialty Chemicals.) Tinuvin 3271 weight section, antioxidant (product scotion, light stabilizer (Sankyo make, SANORULS770) 1 weight section and an ultraviolet ray amount part of vinyltrimetoxysilane (Nippon Unicar make, A-171) duplexs, gamma-aminopropyl 120) 3 weight section and the amount part of curing catalyst dibutyitin bisacetylacetonate

Japanese east transformation make, neo SUTAN U-220) duplexs, After kneading in the state where moisture does not exist substantially under drying conditions, it sealed in the dampproof container and 1 liquid mold-curing nature constituent was obtained.

he recovery was measured by the same method as the above-mentioned using the class product of recovery was measured from the rate which opened this wide at 23 ** and the marked line restored Table 5. However, the stretched state was fixed at 60 ** 100% for 24 hours this time, and the hour afterward. A result is shown in Table 5.

0352

The displacement difference of the distance between the marked lines of 140 hours after immediately the method of the reference examples 5–11, using the class product of Table 5, was massured. As for after performing creap measurement using a shear sample and imposing load by the same method as he valuation basis, the displacament difference made O x for the thing below 0.4 mm, and the acement difference cerried out a thing of 0.4 mm or more. A result is shown in Table 5. 0353

The class product of Table 5 was thinly lengthened in thickness of about 3 mm, and time (leather-Hardenability of a hardenability constituent)

covered time) until the surface stretches a hide under 23 ** and 50% of humidity RH conditions was nessured. The one where leather-covered time is shorter means that hardenability is excellent. A esuft is shown in Table 5.

Table 5

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If the aminositane which has a triethoxy sliyl group which is the (G) ingradiant as an adhesive grant

group as an organic polymer as shown in the <u>reference example</u> 17 of Table 5, Excelling in stability gent is combined with the end of the (A4) ingradient using the polymer which has a triethoxy silyl and oreep resistance, change of the skinning time in storage order is small, and storage stability is

Organic polymer (A–2) 100 weight section which has the reactive silicon group obtained in the synthetic example 2 according to the combination formula shown in Table 6, as DIDP30 weight The reference example 18 and the comparative examples 11-12)

transformation make, neo SUTAN U-220) duplexs were sealed in the glassware which carried out the nitrogen purge, and 1 liquid mold-ouring nature constituent was obtained. In the comparative example the leather-covered time test was performed under 50% of 23 ** humidity RH conditions, without recuperating oneself in this 1 liquid mold-curing nature constituent. In the <u>reference example</u> 18 and the comparative example 12, after promoting the ester exchange reaction between reactive silicon section and a dehydrator — triethoxysilane (made in a col coat.) the N-beta-(aminoethyl)-gamma aminopropyl trimethoxysilane (the Nippon Unicar make.) which is the (H) ingredient as the amount gamma-aminopropyl triethoxysllane (the Shin-Etsu Chemical make.) It added, KBE-6033 weight part of ethyl silicate 28 duplexs, and an adhesion grant agent A-1120) or N-beta-(aminoethyl)section and the amount part of curing catalyst dibutyltin bisacetylacetonate (Japanese east

groups by recuperating oneself for seven days at 50 ** in thesa 1 liquid mold-ouring nature constituents, the leather-covered time test was performed under 50% of 23 ** humidity RH conditions. A result is shown in Table 6.

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(8) 隋水淵 http://www4.ipdl.inpit.go.jp/cgi-bin/tran_web_cgi_ejje?atw_u=http%3A%2F%2Fwww4.ipdli... 2010/04/30

間訊歌刃 71 13 ε (u i w) 旦 無 阜 1月の養生 20₀C × 447.95U-220 凝뻐小動 7 7 KBE-603 基机代科工厂 3 基小ババキナバリ A-1120 **廃** 科 計 素 教 隋水説 7 821-40/14I 7 **|| || || || ||** 30 30 DIDP 00 001 00 基小八八十八 7 \forall **(**† A 素トイ素 基の構造 81 71 組成 (陪量重)

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used for the end of the (A4) ingredient as an organic polymer, if the aminosilane which has a methoxy silyl group which is the (H) ingredient as an adhosive grant agent is combined and an ester exchange reaction is promoted by care of health, the hardenability of an organic polymer can be raised notably. As shown in the reference example 18 of Table 6, the polymar which has a tricthoxy silyl group is

synthetic example 10, Surface treatment colloid calcium carbonate (product made from Shiraishi Organio polymer (A-10) 100 weight section which has the reactive silicon group obtained in the The reference examples 19-20 and comparative example 13)

ndustry, Hakuenka CCR) 120 weight section, Titanium oxide (Ishihara Sangyo make, TIPAQUE R-820) Kusumoto Chemioals], DISUPARON 6500) duplexs, and light stabilizer (the Sankyo make.) SANORU ostalyst of the (E) ingredient as a curing catalyst what carried cut concomitant use addition of BASA bisacetylacetonate (Japanese east transformation make, neo SUTAN U-220) duplexs was made into 3271 weight section, antioxidant (product made from Ouchl Shinko Chemical industry, NOKURAKKU S7701 weight section and an ultraviolet ray absorbent (made in Tiba Specialty Chemicals.) Tinuvin was obtained, the neo decenoic goid (the product made from Japen epoxy resin.) which is a non-tin patalysts were added, after kneading in the state where moisture does not exist substantially under SP) 1 weight section, The amount part of dehydrator vinythimetoxysilane (Nippon Unicar make, A-(71) duplexs, adhesion grant agent N-beta-(aminoethyl)-gamma-aminopropyl trimethoxysilane (the lrying conditions, it sealed in the dampproof container and 1 liquid mold-curing nature constituent Matsumoto Trading make.) What carried out Olga Chicks TC-750 8.5 weight-section addition was weight section — the reference example 19 and isopropoxy titanium bis (ethylscetoscetate) (the tick 106 weight section and the amine (Wako Pure Chemical Industries make, lauryl smine) 0.75 20 weight section, DIDP55 weight section, the amount part of thixotropic grant agent (made in Vippon Unicar make.) A-1120) Three weight sections and the various below-mentioned curing made into the reference example 20. What carried out the amount part addition of dibutyltin the comparative example 13.

class products, the hardened material of the reference example 19 and the reference example 20 showed the recovery higher than the hardened material of the comparative example 13. As a result of measuring the recovery by the same method as the above-mentioned using these

(Synthetic example 11)

0361

To this ally end polypropylene oxide, in the same procedure as the synthetic example 1, it was made to react to triethoxyslane and the polyoxyalkylene sories polymer (A-11) which has an everage of 1.5 group and polypropylane axide of the number average molecular weight 25,500 [about] produced by Jse polyoxypropylene glycol of the molecular weight 2,000 [about] as an initiator, and the hydroxyl used, Allyl and polypropylane oxide was obtained in the same procedure as the synthetic example 1. polymerizing propylene oxide in the zinc hexa cyanocobaltate glyme complex compound catalyst is riethoxy silyl groups at the end was obtained. 0362

(Synthetic example 12)

o the allyl and polypropylene oxide obtained in the synthetic example 11, in the same procedure as the synthetic example 1, it was made to react to methyl dimethoxysilane and the polyoxyalkylene series polymer (A-12) which has an average of 1.5 methyl dimethoxy silyl groups at the end was optained.

The reference example 21 and the comparative examples 14-15) 0363

ection, thixotropic grant agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight section salcium-carbonate (product made from Shiroishi calcium, HOWAITON SB) 20 weight section, DOP40 Drganic polymer (A-11, A-12) 95 weight section which has the reactive silicon group obtained in the salcium carbonats (product made from Shiraishi industry, BISUKO light R) 60 weight section, Heavyproduct made from Shiraishi industry, Hakuenka CCR) 60 weight section, Surface treatment colloid weight section, epoxy system plasticizer (New Jepen Chemical make, SANSO sizer EP-S) 20 weight synthetic example 11 and the synthetic example 12, Surface treatment colloid calcium carbonate

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and a photo-setting resin (the Toagosei make.) ARONIKKUSU M-3093 weight section, light stabilizer Chamicels 1 IRUGA NOx 1010) 1 weight section end the (F) ingredient, or 20 copies were messured, Sankyo make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tiba Specialty Chemicals 1 tinuvin 327) 1 weight aection, Zero copy of minute hollow body (the product made from the Fuji SHIRISHIA chamicala, the FUJIBA lune H-40) which is antioxidant (made in [Tibs Specialty respoctively, and it often kneaded with a 3 paint roll, and was considared as base resin. What added 20 copies of minute hollow bodies was mede into the referenc<u>e example.</u> 21, using (A-12) as en example 14, using (A-12) as an organic polymer, and what added 20 copies of minute hollow bodies organic polymer. What added zero copy of minute hollow body was made into the comparative vas made into the comparative example 15, using (A-11) as an organic polymer. Jsing the mixture of 2-ethylhexanoic acid tin (Japanese east transformation make, U-28) (divalent) 3 veight section and amine (Wako Pure Chemical Industries make, lauryl amine) 0.75 weight section as

a herdening agent, above-mentioned base resin and hardening agent were mixed uniformly, and vorkability (******) and endurance were evaluated. he constituent of the reference example 21 had workability better than the comparative example 14, and its endurance was better than the comparative example 15.

section, epoxy system plasticizer (New Japan Chemical make, SANSO sizer EP-S) 20 weight section, carbonate (product made from Shiraishi industry, BISUKO light R) 60 weight section, Heavy-celcium-RUGA NOx 1010) 1 weight section were measured, respectively, and it often kneaded with a 3 paint example 10, or the synthetic example 1, Surfece treatment colloid calcium carbonate (product made thixotropic grant agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight section, and a (Sankyo make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tibe Specialty carbonate (product made from Shiroishi calcium, HOWAITON SB) 20 weight section, DOP40 weight nada into the reference example 22, and what added 95 oopies of (A-1) as an organic polymer was roll, and wes considered as base resin. What added 70 copies of (A-10) as an organic polymer was ethylkexanoic acid tin (Japanose east transformation make, LJ-28) (divalent) 3 weight section and amine (Wako Pure Chemical Industries make, Isuryl amine) 0,75 weight section was added, and the nade into the comparative example 16.As a hardening agent, to this base resin, the mixture of 2-Organic polymer (A-1) 95 weight section which has the reactive allicon group obtained in organic Chemicals J. tinuvin 327) 1 weight section and antioxidant (made in [Tiba Specialty Chemicals]. bolymer (A-10) 70 weight section which has the reactive silicon group obtained in the synthetic photo-setting resin (the Toagosei make.) ARONIKKUSU M-3093 weight section, light stabilizer from Shiraishi industry, Hakuenka CCR) 60 weight section, Surface treatment colloid calcium The reference example 22 and the comparative example 16) recovery was measured to it.

The constituent of the reference example 22 showed the recovery higher than the comparative example 16, stopping weight % of en organic polymer low.

made from Shiraishi industry. BISUKO light R) 80 weight section, Heavy-calclum-carbonato (oroduot made from Shiroishi calcium, HOWAITON SB) 20 weight section, DOP40 weight section, epoxy NOx 1010) I weight saction and zero copy of epoxy resin (the product made from Japan epoxy resin. Epicoat 828), or five copies were measurad, respectively, and it often kneaded with a 3 paint roll, end Chemicela], tinuvin 327) 1 weight section, Antioxidant (made in [Tiba Specialty Chemicals], IRUGA ndustry, Hakuenka CCR) 60 weight section, Surface treatment colloid calcium carbonate (product system plasticizer (New Japan Chemical make, SANSO sizer EP-S) 20 weight section, thixotropic setting resin (the Toagosei meke.) ARONIKKUSU M-3093 weight section, light stabilizer (Sankyo synthetic example 10, Surface treatment colloid calcium carbonate (product made from Shiraishi grant agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight section, and e photo-Organic polymer (A-10) 95 weight section which has the reactive silicon group obtained in the make, SANORULS770) 1 weight section, Ultraviolet ray absorbent (made in [Tiba Specialty The reference example 23 and the comparative example 17)

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example 23. What added zero copy of apoxy rosin was made into the comparative example 17. As a hardening agent, to this base rosin, the mixtura of 2-ethylhexanoic acid tin (Japanese east was considered as base resin. What added five copies of epoxy resins was made into the <u>reference</u> transformation make, U-28) (divalent) 3 waight section and amine (Wako Pure Chemical Industrias make, lauryl emina) 0.75 weight section was added, and the recovery was massured to it.

The constituent of the reference example 23 showed tha recovery higher than the comparative example 17.

Organic polymer (A-10) 95 weight section which has the reactive silicon group obtained in the The reference example 24 and the comparative example 18)

industry, Hakueinke CCR) 60 weight section, Surface treatment colloid calcium carbonate (product made from Shiraishi industry, BISUKO light R) 60 weight section, Heavy-calcium-carbonate (product RUGA NOx 1010) 1 waight section were measured, respectively, end it often kneaded with a 3 paint system plasticizer (New Japan Ohemical make, SANSO sizer EF-S) 20 weight eection, thiodropic grant agent (made in [Kusumoto Chemicals], DISUPARON 305) 3 weight section, and a photosetting resin (the Toagosei make.) ARONIKKUSU M-3093 weight section, light stabilizer (Sankyo synthetio example 10, Surface treatment colloid calcium carbonate (product made from Shiraishi Chemicals], tinuvin 327) 1 weight saction and antioxident (made in [Tiba Specialty Chemicale]. nade from Shiroishi oalcium, HOWAITON SB) 20 weight section, DOP40 weight section, spoxy nake, SANORULS770) 1 weight section, Ultraviolet ray absorbent (mede in [Tiba Specialty roll, end was considered as base resin. 2-ethylhexanolo acid tin (Japanese east transformation make, U-28) (divalent) 3 weight section and

(divalent) 3 weight section and emine (Wako Pure Chemical Industries make, lauryl emine) 0.75 weight section as a hardening agent was made into the comperetive example 18. Base resin and a hardening The thing using the mixture of 2-ethylhexanoic ecid tin (Japanese east transformation make, U-28) amine (the Wako Pure Chemical Industries make.) leuryl amine 0.75 weight section and dibutytim bissoetylacetonete (the Japanese east — transformation — make.) The thing using the mixture of neo SUTAN U-220 0.1 weight section as a hardening agent is made into the reference example 24, agent were mixed uniformly and the recovery and thin layer hardenability were evaluated.

The constituent of the reference example 24 showed good thin layer hardenability rather than the

comparative example 18, while the high recovery was shown.

To the allyl end polyisobutylene obtained according to the example of manufacture of JP,H11-209639,A, under existance of Pt catalyst, it was made to react to triethoxysilane and the (Synthetic axample 13)

polyisobutylene (A-13) which has a triethoxy silyl group at the end was obtained.

(Synthetic example 14)

To the ally end polyisobuty/ene obtained in the synthetic example 13, under existence of ${\rm Pt}$ catalyst, it was made to react to metry/ dimethoxysilane and the polyisobuty/ene (A-14) which has a metry/ dimethoxy silyl group at the end was obtained.

To organic polymer (A-13, A-14) 100 weight section which has the reactive silicon group obtained in the synthetic example 13 and the synthetic example 14, the amount part of dibutyltin (The reference example 25 and the comperative example 19)

bisacetylacetonate (Japanese east transformation make, neo SUTAN U-220) duplexs was added, and the hardened material was obtained. The thing using (A-13) as an organic polymer was made into the reference example 25, and the thing using (A-14) was made into the comparative example 19. The pardened material of the reference example 25 showed the recovery higher than the comparative example 19.

Synthetic example 15)

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OuBr (4.2g) and acetonitrile (27.3g) were added to the reaction vessel with an agitator, and it stirred Pentametry/ dietry/enetriamine (0.17g) was added and the polymerization was made to start. Acrylic acid n-buty/ (400g) was dropped continuously, heating and stirring at 70 **. Dividing addition of the diethyl edipate (8.8g), and acetonitrile (16.6g) were added to this, and stirring mixing was improved. or 15 minutes at 65 ** under a nitrogen atmosphere. Acrylic acid n-butyl (100g), 2, 5-dibromo mamine (0.68g) was carried out in the middle of dropping of acrylic acid n-butyl.

added to the methylcyclohexane solution of the polymer to 100 copies of polymers, and it heated and **, 1,7-octadien (53.7g), acetonitrile (132g), and triamine (1.69g) were added, it heated and stirred at 10 ** succeedingly, and the mixture containing the polymer which has an alkenyl group was obtained When monomer conversion reaches to 96%, after devolatilizing a ** monomer and acctonitrile at 80 heating devolatilization of acetonitrile in a mixture and the unreacted 1,7-octadien was carried out. copies of KYO word 700SL [:] product [Both] made from Harmony Chemicals) of adsorbent was sediment with a centrifuge, and was removed. Six copies (three copies of KYO word 506SH / 3 and it diluted with the methylcyclohexane. The insoluble polymerization catalyst was made to

00 copies of the polymer with 400 copies of methylcyclohexanes further and removing solid content, After having carried out heating devolatilization (10 or less torr of decompression degrees), diluting polymer [P2] was obtained. The number average molecular weight of this polymer [P2] was 24800, and molecular weight distribution was 1.36. The number of the alkenyl groups introduced per one stirring the obtained polymer [P1] at 180 ** for 12 hours, the solution was condensed and the molecule of polymers was 1.8.

polymer (polymer [P1]) which has an alkenyl group by condensing a polymer solution was obtained.

stirred under oxygen and nitrogen mixed gas atmosphere. Insoluble matter was removed and the

vere added in order, and it mixed, and heated and stirred at 100 ** under a nitrogen atmosphere for thynyf-1, 1 and 3, and 3-tetramethyl disiloxane (they are 1.5 mol equivalents to an alkenyl group) rimethoxysilyl group content polymer (A-15) which condenses a reaction mixture and is made into the purpose was obtained. The number average molecular weight was 27900 and molecular weight distribution was 1.32. The number of the silyl groups introduced per one molecule of polymers was To this polymer [P2], methyl orthoformate (it is 1 mol equivalent to an alkenyl group). A platinum satalyst (it is 10 mg to 1 kg of polymers as an amount of platinum metal), 1-(2-trimethoxysily) 0.5 hour. It checked that the alkenyl group had disappeared by a reaction by ¹H-NMR, and the

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(Synthetic example 16)

average molecular weight was 28600 and molecular weight distribution was 1.48. The number of the ethynyf)-I used in the synthetic example 15, 1 and 3, and 3-tetramethyl disiloxane. The number As opposed to the polymer [P2] obtained in the synthetic example 15. The triethoxy silyl group triethoxysilane (they are 3 mol equivalents to an alkenyl group) instead of 1-(2-trimethoxysilyl content polymer (A-16) was obtained like the synthetic example 15 except having used sily groups introduced per one molecule of polymers was 1.5.

(Synthetic example 17)

(to an alkery! group.) instead of 1-(2-trimethoxysily| ethymy|)-1 used in the synthetic example 15, 1 everage molecular weight was 28400 and molecular weight distribution was 1.51. The number of the As opposed to the polymer [P2] obtained in the synthetic example 15. It is methyl dimethoxysilane and 3, and 3-tetramethyl disiloxane. The methyl dimethoxy silyl group content polymer (A-17) was obtained like the synthetic example 15 except having used three mol equivalents. The number sily! groups introduced per one molecule of polymers was 1.5.

as opposed to organic polymer 100 weight section which has a reactive allicon group — surface treatment colloid calcium carbonate (the product made from the Shiraishi industry.) Hakuenka The reference examples 26-28 and comparative example 20)

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the dampproof container and 1 liquid mold-curing nature constituent was obtained. The **** thing for (A-4) 50 weight section which has the methyl dimethoxy silyl group obtained in the synthetic example 20 weight section, titanium oxida (Iahihara Sangyo make, TIPAQUE R-820) 10 weight section, DIDP60 kneading in the state where moisture does not exist substantially under drying conditions, it sealed in 4. The **** thing for 100 weight sections is made into the reference example 28 for the acrylic ester which has a reactive silloon group, (A-15) Make the **** thing for a total of 100 weight sections into system polymer (A-16) which has the triethoxy silyl group obtained in the synthetic example 16. The system polymer (A-17) which has the methyl dimethoxy silyl group obtained in the synthetic example 17. The hardened material of the <u>refere</u>nce examples 28-28 showed the recovery higher than the 100 weight sections is made into the reference example 26 for the acrylic ester system polymer (Aadhesion grant agent N-beta-(aminoethyl)-gamma-aminopropyl trimethoxysilane (the Nippon Unicar 5) which has the trimethoxyellyl group obtained in the synthetic example 15 as an organic polymer the reference example 27 for the mixture of 50 weight sections and polyoxyalkylene series polymer PHY* thing for 100 weight sections was made into the comparative example 20 for the acrylic ester DISUPARON 6500) duplexs, light stabilizer (Sankyo make, SANORULS765) 1 weight section and an make.) A-1120) Dibutyitin bisacetylacetonate (Japanese east transformation make, neo SUTAN U-CCR150 weight section and heavy calcium corbonate (the Maruo Calcium make.) 25ANANOKKUSU dehydrator vinyltrimetoxysilane (the Nippon Unicar make.) A-171) the amount part of duplexs, and 220) 0.2 weight section was added as the amount part of duplexs, and a curing catalyst, after ultraviolet ray absorbant (made in Tiba Specialty Chemicals.) tinuvin 2131 weight section and weight aection, the amount part of thixotropic grant agent (made in [Kusumoto Ohemicals]. comparative example 20.

The hardenability constituent of this invention is excellent in stability, endurance, and creep Effect of the Invention]

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